OM-1586 155 318Z
2006–05

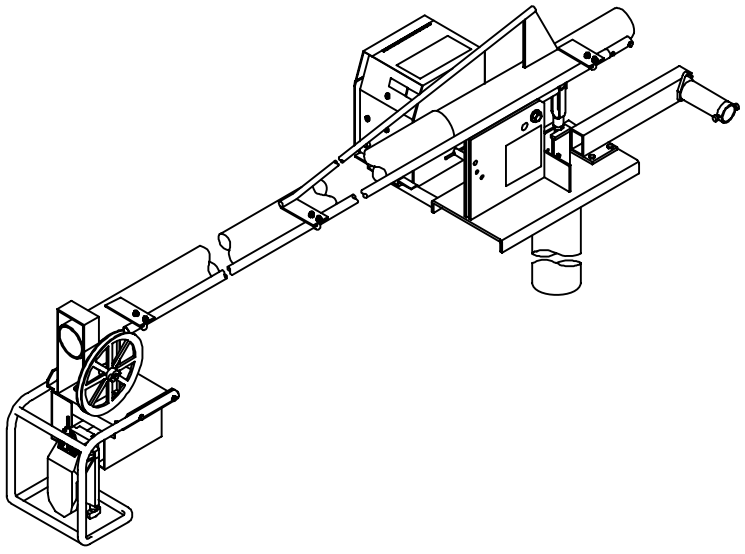
Processes

MIG (GMAW) Welding
Pulsed MIG (GMAW-P)
Flux Cored (FCAW) Welding

Description

Wire Feeder
(Use with CC/CV Power Sources)

SS-64M Swingarc™



12 and 16 Foot

OWNER'S MANUAL

File: MIG (GMAW)

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www.MillerWelds.com

From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite.

ISO 9001:2000 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001:2000 Quality System Standard.

We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual specification sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

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TABLE OF CONTENTS

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING 1
1-1. Symbol Usage 1
1-2. Arc Welding Hazards 1
1-3. Additional Symbols For Installation, Operation, And Maintenance 3
1-4. California Proposition 65 Warnings 3
1-5. Principal Safety Standards 4
1-6. EMF Information 4
SECTION 2 – CONSIGNES DE SÉCURITÉ – À LIRE AVANT UTILISATION 5
2-1. Signification des symboles 5
2-2. Dangers relatifs au soudage à l'arc 5
2-3. Autres symboles relatifs à l'installation, au fonctionnement et à l'entretien de l'appareil. 7
2-4. Principales normes de sécurité 8
2-5. Information sur les champs électromagnétiques 8
SECTION 3 – INTRODUCTION 9
3-1. Specifications 9
SECTION 4 – INSTALLATION 9
4-1. Installing Swivel Into Pipe Post 9
4-2. Installing Boom And Reel Support 10
4-3. Installing Wire Guide Extension 10
4-4. Adjusting Control Tilt Bracket 10
4-5. Equipment Connection Diagram 11
4-6. Connecting Weld Cables And Gas Hoses 12
4-7. Control Box Connections 13
4-8. 14-Pin Plug Information 13
4-9. Removing Safety Collar And Adjusting Boom 14
4-10. Gun Recommendation Table 14
4-11. Wire Type, Size, And Feed Speed Capability Table 14
4-12. Installing And Threading Welding Wire 15
SECTION 5 – OPERATION 16
5-1. Operational Terms 16
5-2. Pulse Welding Terms 16
5-3. Front Panel Controls 17
5-4. Side And Rear Panel Controls 17
SECTION 6 – SETTING SEQUENCE PARAMETERS 18
6-1. Sequence Parameters In A Program 18
SECTION 7 – SETTING DUAL SCHEDULE PARAMETERS 19
7-1. Selecting Dual Schedule Pair 19
7-2. Optional Dual Schedule Switch Diagrams 20
SECTION 8 – USING THE OPTIONAL DATA CARD 21
8-1. Data Card Terms 21
8-2. Installing Data Card 21
8-3. Card Displays 22
8-4. Entering Access Code 23
8-5. Security 24
SECTION 9 – SYSTEM SETUP 25
9-1. Accessing The Setup Menu 25
9-2. System Setup Display Parameters 26

TABLE OF CONTENTS

SECTION 10 – STANDARD PULSE WELDING PROGRAMS FOR PHOENIX/INVISION 456 INVERTER WELDING POWER SOURCES 27

10-1. Program 1 – Steel 27
10-2. Program 2 – Steel 27
10-3. Program 3 – Steel 27
10-4. Program 4 – Steel 28
10-5. Program 5 – Stainless Steel 28
10-6. Program 6 – Stainless Steel 28
10-7. Program 7 – Metal Core 28
10-8. Program 8 – Metal Core 28

SECTION 11 – STANDARD PULSE WELDING PROGRAMS FOR XMT 304 INVERTER WELDING POWER SOURCES 29

11-1. Program 1 – Steel 29
11-2. Program 2 – Steel 29
11-3. Program 3 – Steel 29
11-4. Program 4 – Stainless Steel 30
11-5. Program 5 – Stainless Steel 30
11-6. Program 6 – Stainless Steel 30
11-7. Program 7 – Nickel Alloy 30
11-8. Program 8 – Metal Core 30

SECTION 12 – SETTING SharpArcE CONTROL 31

12-1. Selecting And Adjusting SharpArcE Control 31

SECTION 13 – TEACH POINTS 32

13-1. Teach Using 15 Points 32
13-2. Redefining Teach Points 33

SECTION 14 – MAINTENANCE AND TROUBLESHOOTING 35

14-1. Routine Maintenance 35
14-2. Motor Start Control 35
14-3. Error Displays 36
14-4. Troubleshooting 37

SECTION 15 – ELECTRICAL DIAGRAM 38

SECTION 16 – PARTS LIST 40

OPTIONS AND ACCESSORIES

WARRANTY

SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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▲ **Warning: Protect yourself and others from injury — read and follow these precautions.**

1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-5. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Additional safety precautions are required when any of the following electrically hazardous conditions are present: in damp locations or while wearing wet clothing; on metal structures such as floors, gratings, or scaffolds; when in cramped positions such as sitting, kneeling, or lying; or when there is a high risk of unavoidable or accidental contact with the workpiece or ground. For these conditions, use the following equipment in order presented: 1) a semiautomatic DC constant voltage (wire) welder, 2) a DC manual (stick) welder, or 3) an AC welder with reduced open-circuit voltage. In most situations, use of a DC, constant voltage wire welder is recommended. And, do not work alone!
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Do not touch electrode holders connected to two welding machines at the same time since double open-circuit voltage will be present.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists in inverter-type welding power sources after removal of input power.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use local forced ventilation at the arc to remove welding fumes and gases.
- If ventilation is poor, wear an approved air-supplied respirator.
- Read and understand the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

ARC RAYS can burn eyes and skin.

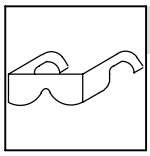
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear an approved welding helmet fitted with a proper shade of filter lenses to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash, glare and sparks; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather, heavy cotton, or wool) and foot protection.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Do not weld where flying sparks can strike flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock, sparks, and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.
- Follow requirements in OSHA 1910.252 (a) (2) (iv) and NFPA 51B for hot work and have a fire watcher and extinguisher nearby.



FLYING METAL can injure eyes.

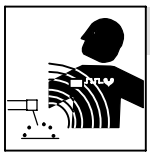
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.
- To handle hot parts, use proper tools and/or wear heavy, insulated welding gloves and clothing to prevent burns.



MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, physical damage, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Use the right equipment, correct procedures, and sufficient number of persons to lift and move cylinders.
- Read and follow instructions on compressed gas cylinders, associated equipment, and Compressed Gas Association (CGA) publication P-1 listed in Safety Standards.

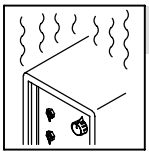
1-3. Additional Symbols For Installation, Operation, And Maintenance

FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

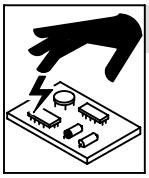
FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

MOVING PARTS can cause injury.

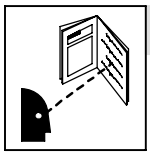
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

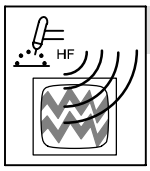
MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Have only qualified persons remove doors, panels, covers, or guards for maintenance as necessary.
- Reinstall doors, panels, covers, or guards when maintenance is finished and before re-connecting input power.



READ INSTRUCTIONS.

- Read Owner's Manual before using or servicing unit.
- Use only genuine Miller/Hobart replacement parts.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

1-4. California Proposition 65 Warnings

▲ **Welding or cutting equipment produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)**

▲ **Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.**

For Gasoline Engines:

▲ **Engine exhaust contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.**

For Diesel Engines:

▲ **Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.**

1-5. Principal Safety Standards

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1 from Global Engineering Documents (phone: 1-877-413-5184, website: www.global.ihs.com).

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202–4102 (phone: 703–412–0900, website: www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (phone: 800–463–6727 or in Toronto 416–747–4044, website: www.csa–international.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 11 West 42nd Street, New York, NY 10036–8002 (phone: 212–642–4900, website: www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, from National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269–9101 (phone: 617–770–3000, website: www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, from U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (there are 10 Regional Offices––phone for Region 5, Chicago, is 312–353–2220, website: www.osha.gov).

1-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: "The body of evidence, in the committee's judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard." However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor before welding or going near welding operations. If cleared by your doctor, then following the above procedures is recommended.

SECTION 2 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

▲ **Avertissement : se protéger et protéger les autres contre le risque de blessure — lire et respecter ces consignes.**

2-1. Symboles utilisés

Symbole graphique d'avertissement ! Attention ! Cette procédure comporte des risques possibles ! Les dangers éventuels sont représentés par les symboles graphiques joints.

▲ **Indique un message de sécurité particulier**

☞ *Signifie NOTE ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Avertissement ! Attention ! Risques d'ÉLECTROCUTION, ORGANES MOBILES et PARTIES CHAUDES. Consulter les symboles et les instructions afférentes ci-dessous concernant les mesures à prendre pour supprimer les dangers.

2-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles représentés ci-dessous sont utilisés dans ce manuel pour attirer l'attention et identifier les dangers possibles. En présence de l'un de ces symboles, prendre garde et suivre les instructions afférentes pour éviter tout risque. Les instructions en matière de sécurité indiquées ci-dessous ne constituent qu'un sommaire des instructions de sécurité plus complètes fournies dans les normes de sécurité énumérées dans la Section 2-5. Lire et observer toutes les normes de sécurité.**

▲ **Seul un personnel qualifié est autorisé à installer, faire fonctionner, entretenir et réparer cet appareil.**

▲ **Pendant le fonctionnement, maintenir à distance toutes les personnes, notamment les enfants de l'appareil.**

UNE DÉCHARGE ÉLECTRIQUE peut entraîner la mort.

Le contact d'organes électriques sous tension peut provoquer des accidents mortels ou des brûlures graves. Le circuit de l'électrode et de la pièce est sous tension lorsque le courant est délivré à la sortie. Le circuit d'alimentation et les circuits internes de la machine sont également sous tension lorsque l'alimentation est sur Marche. Dans le mode de soudage avec du fil, le fil, le dérouleur, le bloc de commande du rouleau et toutes les parties métalliques en contact avec le fil sont sous tension électrique. Un équipement installé ou mis à la terre de manière incorrecte ou impropre constitue un danger.

- Ne pas toucher aux pièces électriques sous tension.
- Porter des gants isolants et des vêtements de protection secs et sans trous.
- S'isoler de la pièce à couper et du sol en utilisant des housses ou des tapis assez grands afin d'éviter tout contact physique avec la pièce à couper ou le sol.
- Ne pas se servir de source électrique à courant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique à courant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique à courant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- D'autres consignes de sécurité sont nécessaires dans les conditions suivantes : risques électriques dans un environnement humide ou si l'on porte des vêtements mouillés ; sur des structures métalliques telles que sols, grilles ou échafaudages ; en position coincée comme assise, à genoux ou couchée ; ou s'il y a un risque élevé de contact inévitable ou accidentel avec la pièce à souder ou le sol. Dans ces conditions, utiliser les équipements suivants, dans l'ordre indiqué : 1) un poste à souder DC à tension constante (à fil), 2) un poste à souder DC manuel (électrode) ou 3) un poste à souder AC à tension à vide réduite. Dans la plupart des situations, l'utilisation d'un poste à souder DC à fil à tension constante est recommandée. En outre, ne pas travailler seul !
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer le poste correctement et le mettre à la terre convenablement selon les consignes du manuel de l'opérateur et les normes nationales, provinciales et locales.
- Toujours vérifier la terre du cordon d'alimentation. Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée, fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation afin de s'assurer qu'il n'est pas altéré ou à nu, le remplacer immédiatement s'il l'est. Un fil à nu peut entraîner la mort.
- L'équipement doit être hors tension lorsqu'il n'est pas utilisé.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- Ne pas toucher des porte électrodes connectés à deux machines en même temps à cause de la présence d'une tension à vide doublée.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité si l'on doit travailler au-dessus du sol.
- S'assurer que tous les panneaux et couvercles sont correctement en place.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.
- Ne pas raccorder plus d'une électrode ou plus d'un câble de masse à une même borne de sortie de soudage.

Il reste une TENSION DC NON NÉGLIGEABLE dans les sources de soudage onduleur quand on a coupé l'alimentation.

- Arrêter les convertisseurs, débrancher le courant électrique et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie Entretien avant de toucher les pièces.

LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereuse pour la santé.

- Ne pas mettre sa tête au-dessus des vapeurs. Ne pas respirer ces vapeurs.
- À l'intérieur, ventiler la zone et/ou utiliser une ventilation forcée au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est médiocre, porter un respirateur anti-vapeurs approuvé.
- Lire et comprendre les spécifications de sécurité des matériaux (MSDS) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé et en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LES RAYONS D'ARC peuvent entraîner des brûlures aux yeux et à la peau.

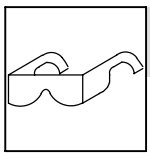
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage approuvé muni de verres filtrants approprié pour protéger visage et yeux pendant le soudage (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des lunettes de sécurité avec écrans latéraux même sous votre casque.
- Avoir recours à des écrans protecteurs ou à des rideaux pour protéger les autres contre les rayonnements les éblouissements et les étincelles ; prévenir toute personne sur les lieux de ne pas regarder l'arc.
- Porter des vêtements confectionnés avec des matières résistantes et ignifuges (cuir, coton lourd ou laine) et des bottes de protection.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peuvent provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, une surchauffe ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité, les recouvrir soigneusement avec des protections homologuées.
- Ne pas souder dans un endroit où des étincelles peuvent tomber sur des substances inflammables.
- Se protéger, ainsi que toute autre personne travaillant sur les lieux, contre les étincelles et le métal chaud.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Afin d'éliminer tout risque de feu, être vigilant et garder toujours un extincteur à la portée de main.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble de masse sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution, d'étincelles et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non-utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection exempts d'huile tels que des gants en cuir, une veste résistante, des pantalons sans revers, des bottes et un casque.
- Avant de souder, retirer toute substance combustible de ses poches telles qu'un allumeur au butane ou des allumettes.
- Suivre les consignes de OSHA 1910.252 (a) (2) (iv) et de NFPA 51B pour travaux de soudage et prévoir un détecteur d'incendie et un extincteur à proximité.



DES PARTICULES VOLANTES peuvent blesser les yeux.

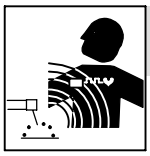
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non-utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respiratoire d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues.
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.
- Ne pas toucher aux pièces chaudes, utiliser les outils recommandés et porter des gants de soudage et des vêtements épais pour éviter les brûlures.



LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, rester à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

LE BRUIT peut endommager l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvées pour les oreilles si le niveau sonore est trop élevé.

LES BOUTEILLES peuvent exploser si elles sont endommagées.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, des dommages physiques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique ; les maintenir ainsi que les éléments associés en bon état.
- Détourner votre visage du détendeur-régulateur lorsque vous ouvrez la soupape de la bouteille.
- Le couvercle du détendeur doit toujours être en place, sauf lorsque la bouteille est utilisée ou qu'elle est reliée pour usage ultérieur.
- Utiliser les équipements corrects, les bonnes procédures et suffisamment de personnes pour soulever et déplacer les bouteilles.
- Lire et suivre les instructions sur les bouteilles de gaz comprimé, l'équipement connexe et le dépliant P-1 de la CGA (Compressed Gas Association) mentionné dans les principales normes de sécurité.

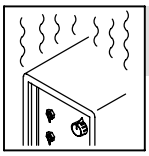
2-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Ne pas installer l'appareil à proximité de produits inflammables.
- Ne pas surcharger l'installation électrique – s'assurer que l'alimentation est correctement dimensionnée et protégée avant de mettre l'appareil en service.

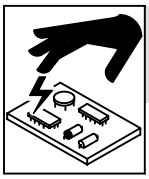
LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariots, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement ; respecter le cycle opératoire nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.



LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes PC.

DES ORGANES MOBILES peuvent provoquer des blessures.

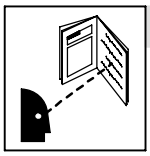
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gâchette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

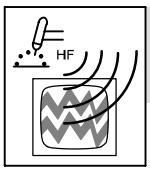
DES ORGANES MOBILES peuvent provoquer des blessures.

- S'abstenir de toucher des organes mobiles tels que des ventilateurs.
- Maintenir fermés et verrouillés les portes, panneaux, recouvrements et dispositifs de protection.
- Seules des personnes qualifiées sont autorisées à enlever les portes, panneaux, recouvrements ou dispositifs de protection pour l'entretien.
- Remettre les portes, panneaux, recouvrements ou dispositifs de protection quand l'entretien est terminé et avant de rebrancher l'alimentation électrique.



LIRE LES INSTRUCTIONS.

- Lire le manuel d'utilisation avant d'utiliser ou d'intervenir sur l'appareil.
- Utiliser uniquement des pièces de rechange Miller/Hobart.



LE RAYONNEMENT HAUTE FRÉQUENCE (HF) risque de provoquer des interférences.

- Le rayonnement haute fréquence (HF) peut provoquer des interférences avec les équipements de radio-navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique peut gêner le fonctionnement d'appareils électroniques comme des ordinateurs et des robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

2-4. Proposition californienne 65 Avertissements

▲ **Les équipements de soudage et de coupage produisent des fumées et des gaz qui contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des malformations congénitales et, dans certains cas, des cancers. (Code de santé et de sécurité de Californie, chapitre 25249.5 et suivants)**

▲ **Les batteries, les bornes et autres accessoires contiennent du plomb et des composés à base de plomb, produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation. Se laver les mains après manipulation.**

Pour les moteurs à essence :

▲ **Les gaz d'échappement des moteurs contiennent des produits chimiques dont l'État de Californie reconnaît qu'ils provoquent des cancers et des malformations congénitales ou autres problèmes de procréation.**

Pour les moteurs diesel :

▲ **Les gaz d'échappement des moteurs diesel et certains de leurs composants sont reconnus par l'État de Californie comme provoquant des cancers et des malformations congénitales ou autres problèmes de procréation.**

2-5. Principales normes de sécurité

Safety in Welding, Cutting, and Allied Processes, ANSI Standard Z49.1, de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping, American Welding Society Standard AWS F4.1 de Global Engineering Documents (téléphone : 1-877-413-5184, site Internet : www.global.ihs.com).

National Electrical Code, NFPA Standard 70, de National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de Compressed Gas Association, 1735 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102 (téléphone : 703-412-0900, site Internet : www.cganet.com).

Code for Safety in Welding and Cutting, CSA Standard W117.2, de Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3 (téléphone : 800-463-6727 ou à Toronto 416-747-4044, site Internet : www.csa-international.org).

Practice For Occupational And Educational Eye And Face Protection, ANSI Standard Z87.1, de American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002 (téléphone : 212-642-4900, site Internet : www.ansi.org).

Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, NFPA Standard 51B, de National Fire Protection Association, P.O. Box 9101, 1 Battery March Park, Quincy, MA 02269-9101 (téléphone : 617-770-3000, site Internet : www.nfpa.org).

OSHA, Occupational Safety and Health Standards for General Industry, Title 29, Code of Federal Regulations (CFR), Part 1910, Subpart Q, and Part 1926, Subpart J, de U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250 (il y a 10 bureaux régionaux––le téléphone de la région 5, Chicago, est 312-353-2220, site Internet : www.osha.gov).

2-6. Information EMF

Considérations sur le soudage et les effets de basse fréquence et des champs magnétiques et électriques.

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu : « L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine ». Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Pour réduire les champs magnétiques sur le poste de travail, appliquer les procédures suivantes :

1. Maintenir les câbles ensemble en les tordant ou en les enveloppant.
2. Disposer les câbles d'un côté et à distance de l'opérateur.
3. Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.
4. Garder le poste de soudage et les câbles le plus loin possible de vous.
5. Connecter la pince sur la pièce aussi près que possible de la soudure.

En ce qui concerne les stimulateurs cardiaques

Les porteurs de stimulateur cardiaque doivent consulter leur médecin avant de souder ou d'approcher des opérations de soudage. Si le médecin approuve, il est recommandé de suivre les procédures précédentes.

SECTION 3 – INTRODUCTION

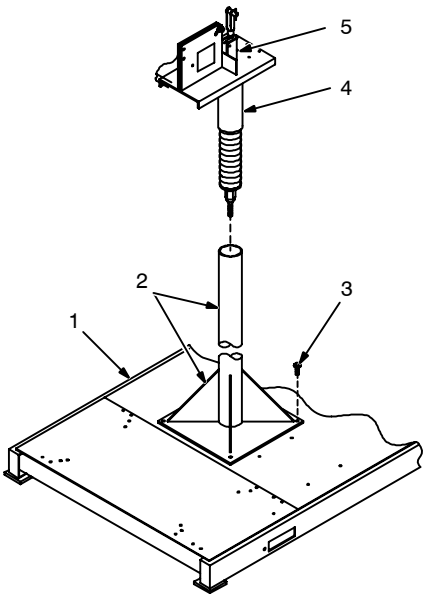
3-1. Specifications

Type of Input Power	Welding Power Source Type	Wire Feed Speed Range	Wire Diameter Range	Welding Circuit Rating	Weight
24 Volts AC Single-Phase 10 Amperes 50/60 Hertz	Constant Voltage (CV) DC For GMAW Or Constant Voltage (CV) / Constant Current (CC) DC For GMAW-P All Need 14-Pin And Contactor Control	Standard: 50 To 780 ipm (1.3 To 19.8 mpm) Optional High Speed: 92 To 1435 ipm (2.3 To 36.5 mpm)	.023 To 1/8 in (0.6 To 3.2 mm) Max Spool Weight: 60 lb (27 kg)	100 Volts, 750 Amperes, 100% Duty Cycle	12 ft (3.7 m): 160 lb (73 kg) 16 ft (4.9 m): 210 lb (95 kg)

	12 ft (3.7 m) Boom	16 ft (4.9 m) Boom
Maximum Height With 4 ft (1.2 m) Post	17 ft (5.2 m)	21 ft (6.4 m)
Vertical Lift Of Boom	Horizontal to 60° Above Horizontal	Horizontal to 60° Above Horizontal

SECTION 4 – INSTALLATION

4-1. Installing Swivel Into Pipe Post



1 Swingpak Base or CBC Cart

2 Pipe Post With Base

3 Steel Bolt

Secure as shown using as a minimum 1/2 in diameter SAE grade 5 steel bolts.

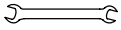
4 Swivel Assembly

Insert into pipe post. Lubricate swivel.

5 Safety Collar

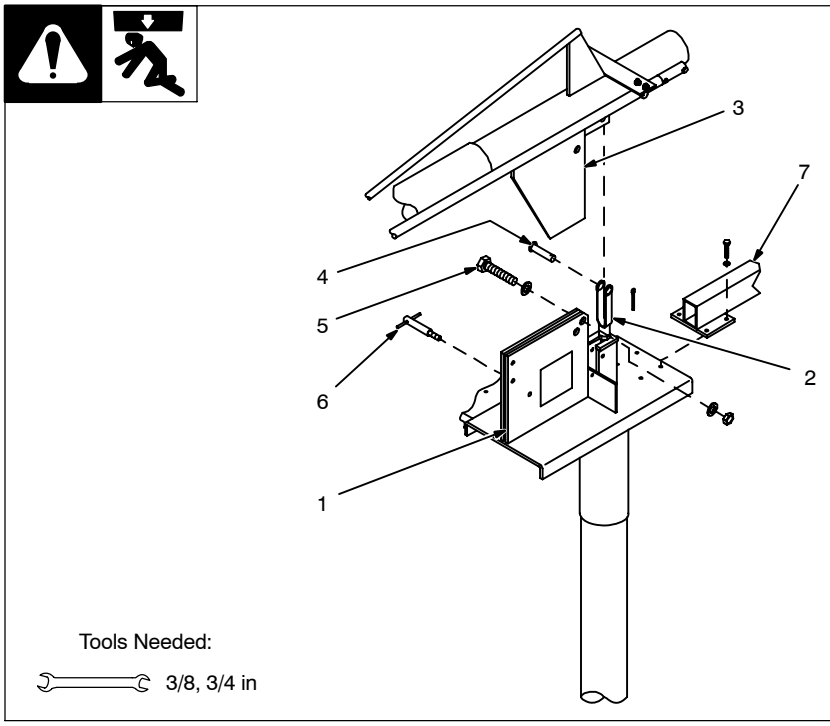
▲ **Do not remove until instructed to.**

Tools Needed:

 3/4 in

ST-152 268

4-2. Installing Boom And Reel Support



1 Swivel Plates

2 Yoke

Remove hardware from swivel plates and yoke.

3 Boom

Set boom into swivel as shown.

4 Yoke Pin

Install pin through yoke. Install cotter pin and spread ends.

5 Bolt

Install bolt, tighten hardware, and back bolt off one half turn.

6 Locking Knob

Install locking knob but do not tighten.

7 Reel Support

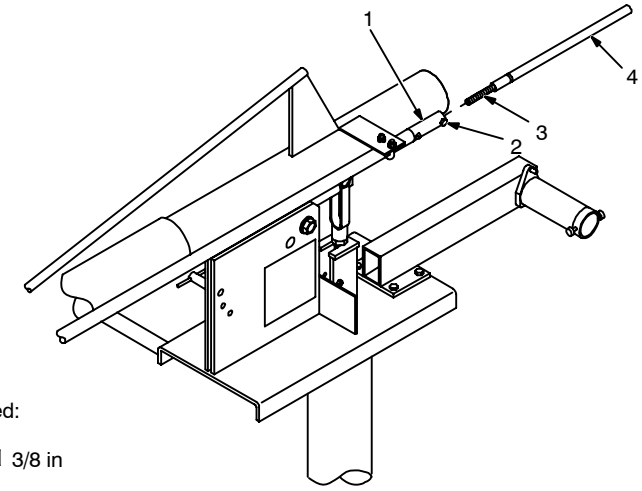
Install reel support.

Tools Needed:

3/8, 3/4 in

ST-142 596-C

4-3. Installing Wire Guide Extension



1 Wire Guide Fitting

2 Bolt

3 Monocoil Liner

4 Wire Guide Extension

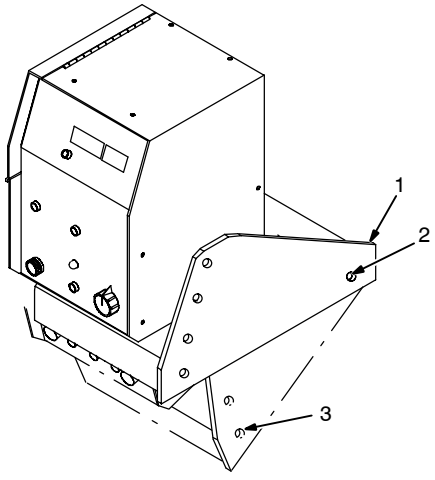
Tighten bolt to secure liner in wire guide fitting. Do not overtighten bolt and crush liner.

Tools Needed:

3/8 in

ST-152 323

4-4. Adjusting Control Tilt Bracket



1 Tilt Bracket

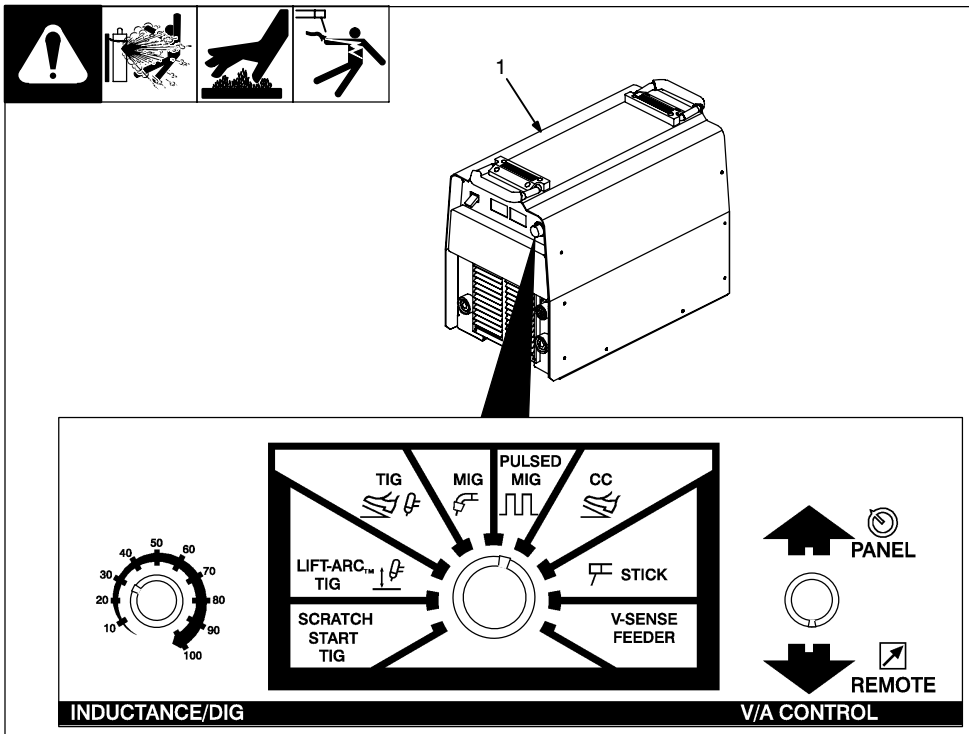
2 Rear Pivot Screw

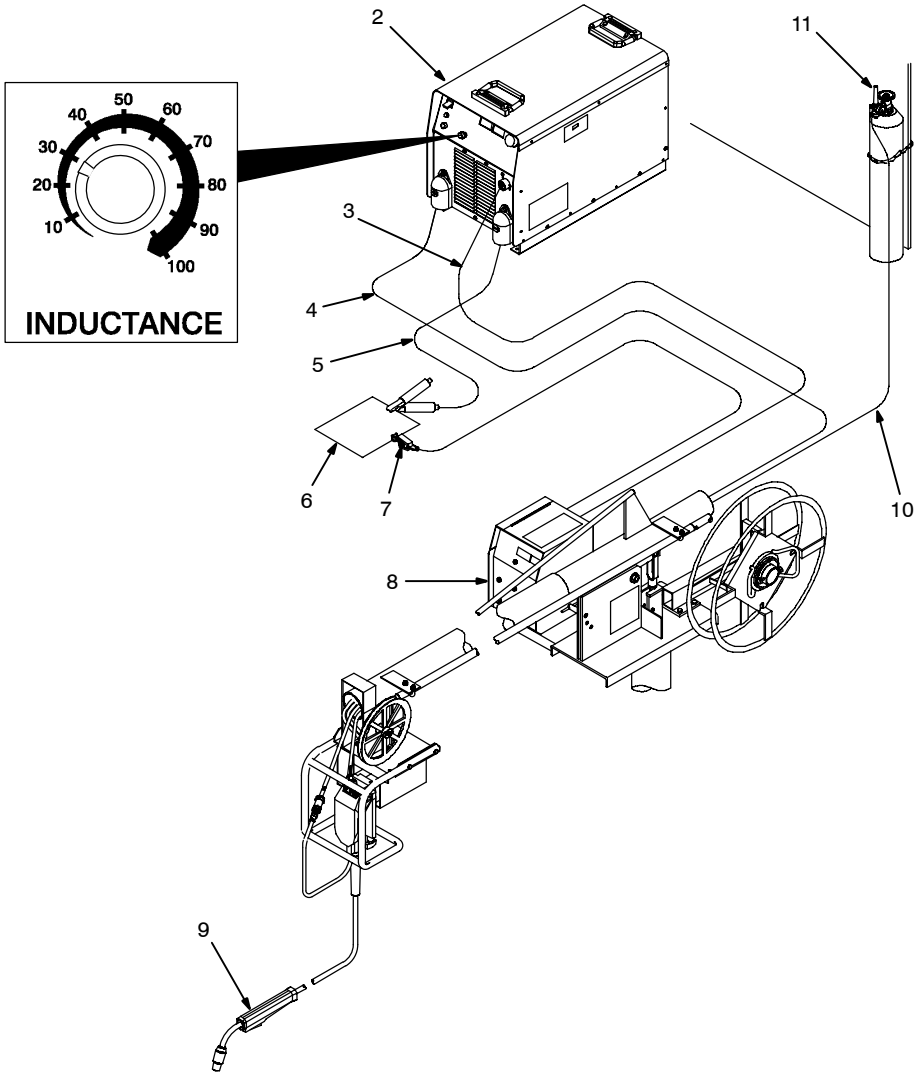
3 Front Screw

Loosen rear pivot screw. Remove front screw. Pivot control downward to desired viewing angle. Replace and tighten front screw. Tighten pivot screw.

ST-801 279

4-5. Equipment Connection Diagram





1 300/400 Ampere Model CC/CV Inverter Welding Power Source

☞ *Use settings shown for both pulse MIG welding and MIG welding.*

2 450 Ampere Model DC Inverter Welding Power Source

3 14-Pin Cord

4 Positive (+) Weld Cable

5 Negative (–) Weld Cable

Be sure weld cables are sized properly for peak amperage if pulse welding (see welding power source Owner's Manual).

6 Workpiece

7 Voltage Sensing Lead (Optional Use)

8 Wire Feeder

For connections see Section 4-7.

9 Gun

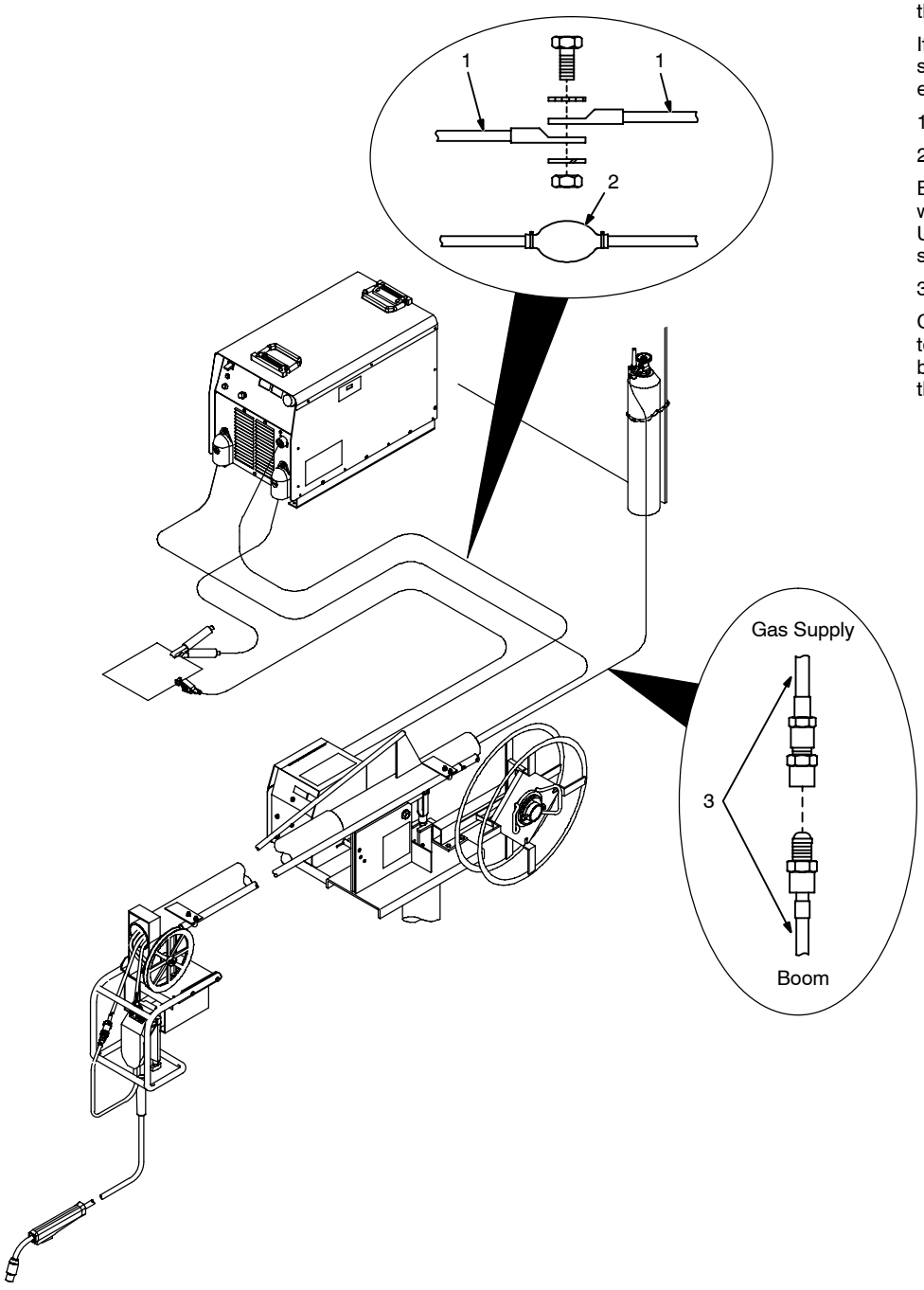
Be sure gun is rated for peak amperage if pulse welding. Install according to its Owner's Manual.

10 Gas Hose From Boom

11 Shielding Gas Supply

ST-801 805 / Ref. ST-175 086 / Ref. ST-180 311-B

4-6. Connecting Weld Cables And Gas Hoses



The weld cable and shielding gas hose extend 10 ft (3 m) from the boom.

Route weld cable from boom through reed relay, if applicable.

If the welding power source or gas supply are further from the boom, extend cable or hose as follows:

1 Weld Cable

2 Insulated Sleeving

Bolt together weld cables from welding power source and boom. Use electrical tape and insulated sleeving to cover connection.

3 Shielding Gas Hose

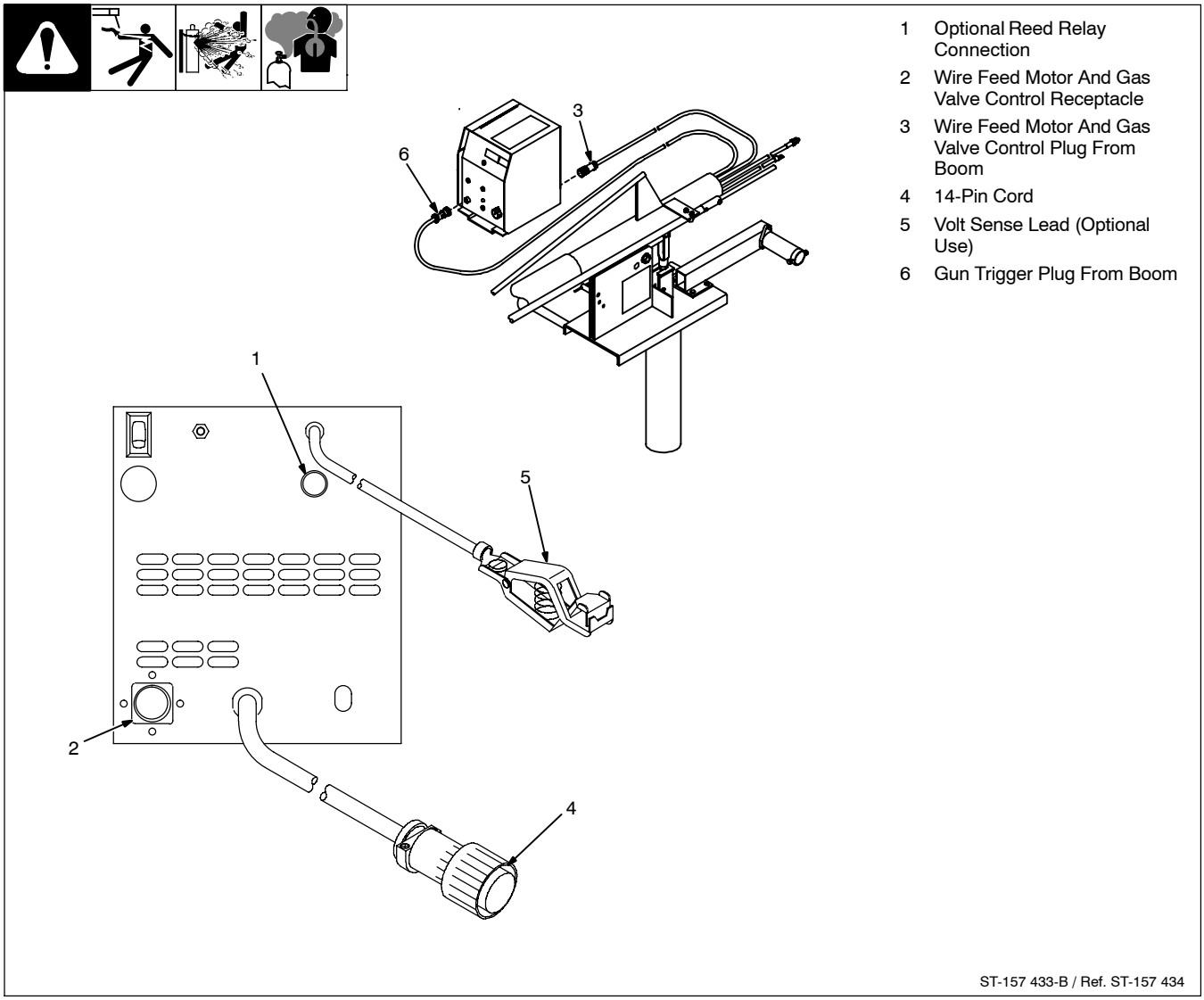
Connect hose to gas supply or extension hose. The hose from the boom has 5/8-18 right-hand threads.

Tools Needed:

5/8 in

Ref. ST-801 805 / Ref. ST-152 800-A

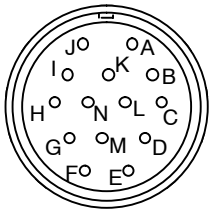
4-7. Control Box Connections



1 Optional Reed Relay Connection
2 Wire Feed Motor And Gas Valve Control Receptacle
3 Wire Feed Motor And Gas Valve Control Plug From Boom
4 14-Pin Cord
5 Volt Sense Lead (Optional Use)
6 Gun Trigger Plug From Boom

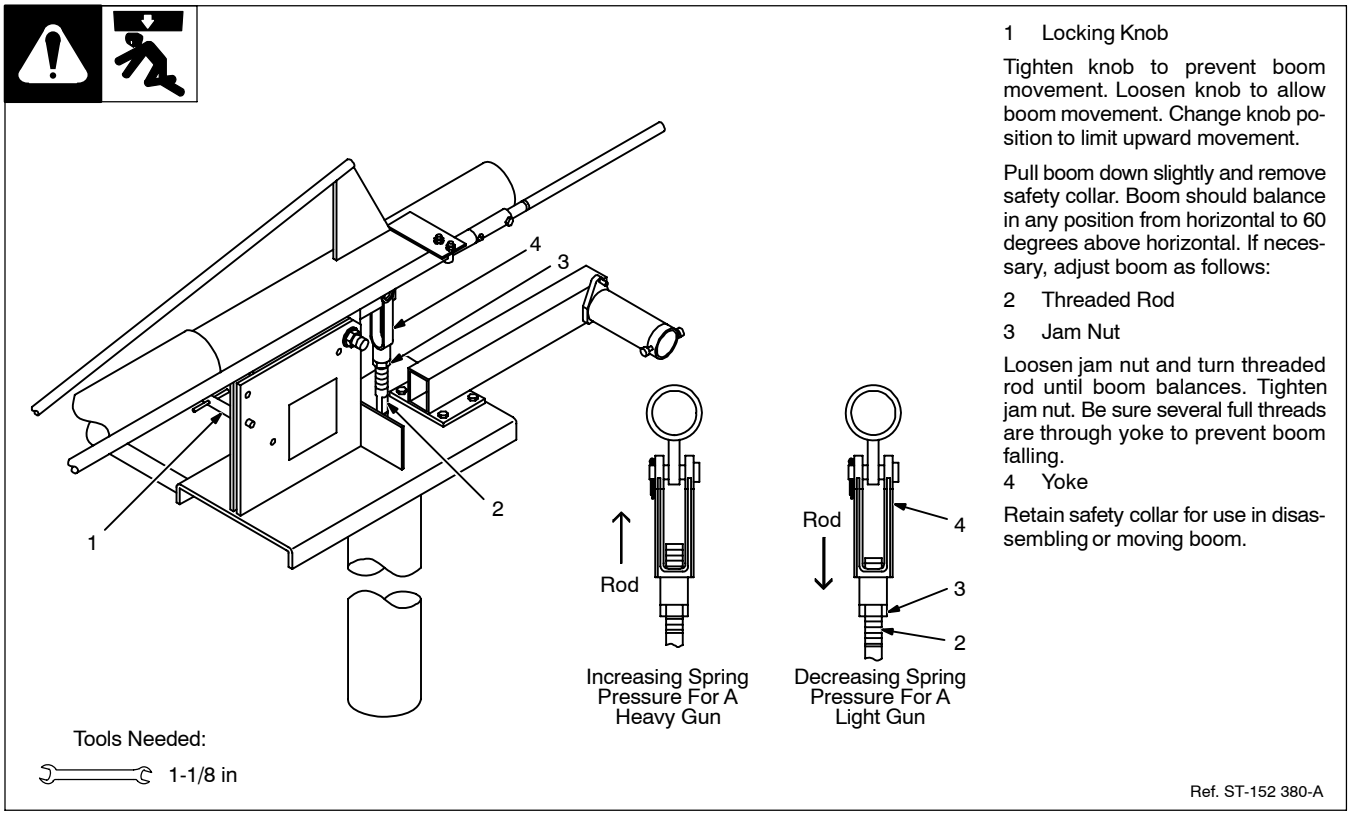
ST-157 433-B / Ref. ST-157 434

4-8. 14-Pin Plug Information

REMOTE 14	Pin*	Pin Information
	A	24 volts ac with respect to socket G.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
	G	Circuit common for 24 volts AC circuit.
	C	+10 volts dc output to remote control with respect to socket D.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control with respect to socket D.
	H	Voltage feedback; 0 to +10 volts dc, 1 volt per 10 arc volts.
	F	Current feedback; 0 to +10 volts dc, 1 volt per 100 amperes.
	M	CC/CV Select (+24 V = CV)
	N	Inductance (0-10 V)

*The remaining pins are not used.

4-9. Removing Safety Collar And Adjusting Boom



1 Locking Knob

Tighten knob to prevent boom movement. Loosen knob to allow boom movement. Change knob position to limit upward movement.

Pull boom down slightly and remove safety collar. Boom should balance in any position from horizontal to 60 degrees above horizontal. If necessary, adjust boom as follows:

2 Threaded Rod

3 Jam Nut

Loosen jam nut and turn threaded rod until boom balances. Tighten jam nut. Be sure several full threads are through yoke to prevent boom falling.

4 Yoke

Retain safety collar for use in disassembling or moving boom.

Tools Needed:

1-1/8 in

Ref. ST-152 380-A

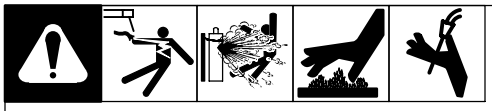
4-10. Gun Recommendation Table

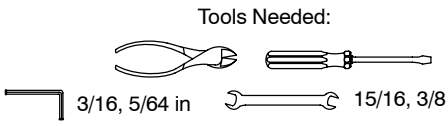
Process	Gun
GMAW – Hard or Cored Wires	Roughneck C-Series Guns: 300, 400, 500, And 600 Amp.
FCAW – Self-Shielding Wires	FC-1260 Or FC-1150

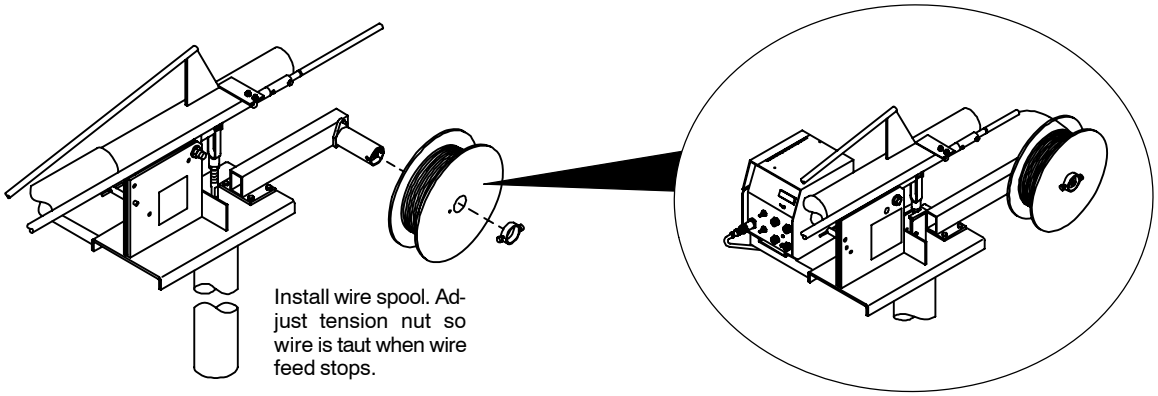
4-11. Wire Type, Size, And Feed Speed Capability Table

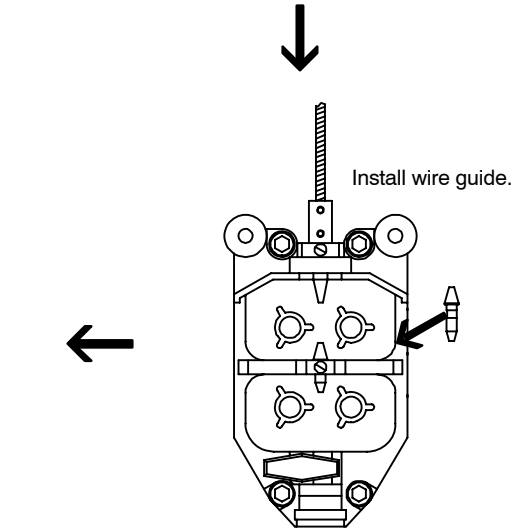
Motor Speed	Wire Type	Wire Size	Feed Speed Capability
Standard	All	.023 To 5/64 in (0.6 To 2 mm)	50 To 780 ipm (1.3 To 19.8 mpm)
Standard	All	3/32 To 7/64 in (2.4 To 2.8 mm)	50 To 700 ipm (1.3 To 17.8 mpm)
Standard	All	1/8 in (3.2 mm)	50 To 300 ipm (1.3 To 7.6 mpm)
Optional High Speed	All	.023 To 5/64 in (0.6 To 2 mm)	92 To 1440 ipm (2.3 To 35.6 mpm)

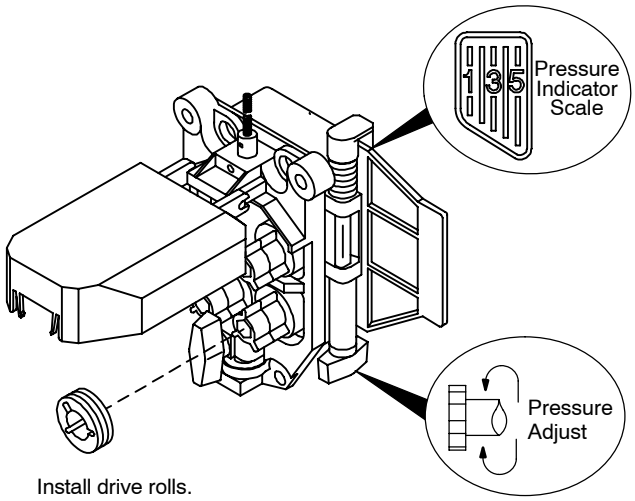
4-12. Installing And Threading Welding Wire

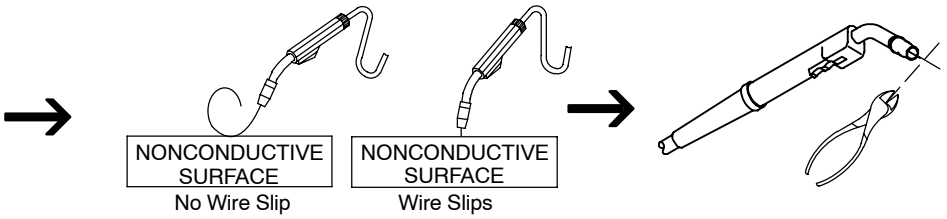












☞ *Be sure that outlet cable has proper size liner for the welding wire size. When installing gun, position liner extending from outlet wire guide as close as possible to drive rolls without touching.*

Install gun. Lay gun cable out straight. Cut off end of wire. Push wire through guides up to drive rolls; continue to hold wire. Press Jog button to feed wire out gun.

☞ *For soft wire or small diameter stainless steel wire, use 2 drive rolls and set drive roll pressure from 0 to a maximum of 4 on the pressure indicator scale (so that only the inner spring is compressed). This setting will generally give the best performance for these types of wires.*

To adjust drive roll pressure, hold nozzle about 2 in (51 mm) from nonconductive surface and press gun trigger to feed wire against surface. Tighten knob so wire does not slip. Do not overtighten. If contact tip is completely blocked, wire should slip at the feeder (see pressure adjustment above).

Cut wire off. Close cover.

Repeat for other side.

ST-152 648-A / Ref. ST-157 432 / Ref. ST-137 391-A / ST-142 597-A / Ref. S-0627-A / Ref. ST-150 922

SECTION 5 – OPERATION

5-1. Operational Terms

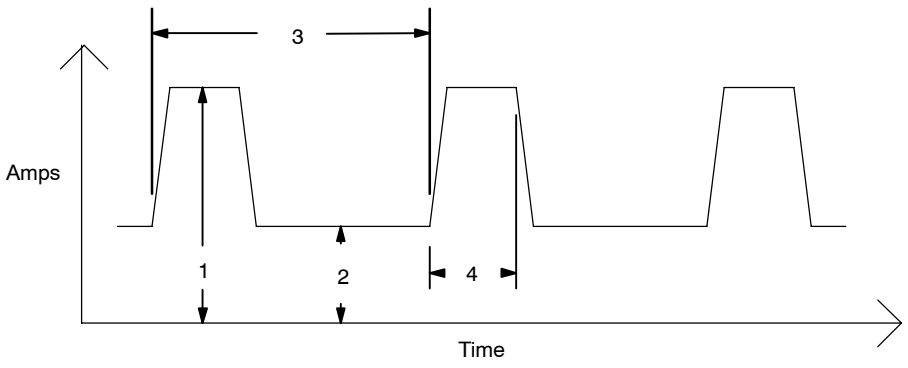
Note ☞ *See Menu Guide for detailed programming steps.*

The following is a list of terms and their definitions as they apply to this wire feeder:

General Terms:	
Adaptive Pulse Welding	The wire feeder automatically regulates pulse frequency to maintain a constant arc length, regardless of change in welding wire stickout.
Cold Wire Jog	When weld amperage is not present, wire feeds for about three seconds at set wire feed speed. Then the welding power source contactor deenergizes and wire continues to feed at the wire jog speed.
Inductance	As inductance increases, arc on time increases, and the weld puddle becomes more fluid.
SharpArc™	Arc cone width and arc characteristics adjustment in pulse welding. Increasing SharpArc value decreases the arc cone width.
Trim	Arc length adjustment in pulse welding. Increasing trim increases the actual arc length. Trim is replaced by volts in MIG programs.
Synergic	The operator programs pulse parameters for a specific wire feed speed. The wire feeder determines the pulse parameters between these wire feed speed increments.

Side Panel Terms:	
Process Mode	Is used to select the type of process to be used, including Pulse, Adaptive Pulse, or Mig.
Sequence Mode	Is used to select and program the weld sequences which include weld, crater, burnback, postflow, preflow, run-in, and start.
Dual Schedule Mode	Is used to select a pair of programs that can be used together.
Card Mode	Is used to select use of the optional data card storage and retrieval capabilities.
Security Mode	Only functions with an optional data card. Allows using the lock feature for restricting range of program parameter changing.

5-2. Pulse Welding Terms



1 Apk = Peak Amperage

Increasing Apk increases penetration.

Vpk = Peak Voltage

Arc voltage during peak current phase of the pulse waveform. This determines arc length during adaptive pulse welding.

2 Abk = Background Amperage

Maintains arc between pulses.

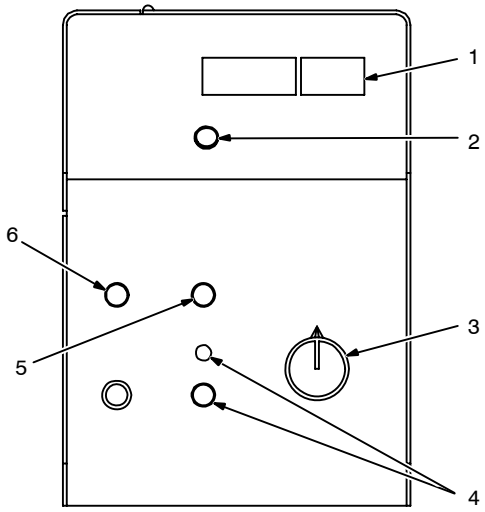
3 PPS = Pulses Per Second

Increasing PPS increases travel speed.

4 PWms = Pulse Width In Milliseconds

Increasing PWms increases bead width.

5-3. Front Panel Controls



Ref. ST-155 222

1 Display

2 Parameter Select Button

Press button to move > (the cursor) on the display.

3 Display Control

Turn control to change value pointed to by >.

Turning control one click causes Trim (arc length) to increase/decrease by one or Volts to increase/decrease by 0.1.

When IPM is selected, turning control one click causes wire feed speed (IPM) to increase/decrease by one.

When MPM is selected, turning control three clicks causes wire feed speed (MPM) to increase by 0.1.

When Prg # is selected, turning control one click causes program number (Prg #) to increase/decrease by one.

The program number cannot be changed while welding, with exception of Dual Schedule Mode (see Section 7).

SharpArc™ is "Arc" on the display (see Section 12). It is used to adjust arc cone width and arc characteristics.

Pulse is a default setting. To change type of process (Pulse, Adaptive Pulse, or MIG) use side panel controls (see Section 5-4).

4 Trigger Hold Button And Indicator Light

Trigger Hold can be set on a per program basis. Indicator light comes on for programs where this feature is active.

To weld without holding gun trigger throughout weld cycle, press and release button to turn feature on (indicator light turns on).

To start weld cycle, press and release gun trigger within three seconds after an arc has been struck. To end weld cycle, press and release gun trigger.

5 Jog Button

Push to momentarily feed welding wire without energizing welding circuit or shielding gas valve.

Jog speed is varied using the Display Control while Jog button is pressed. Default setting is 200 IPM.

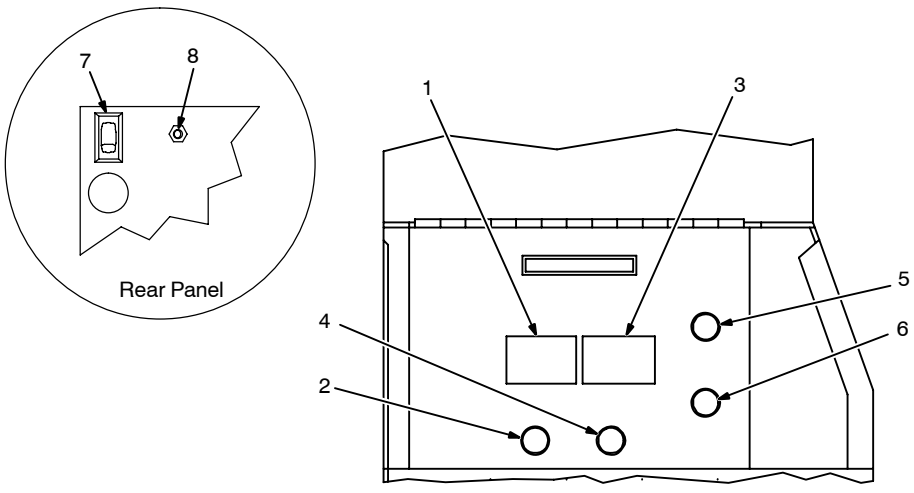
6 Purge Button

Push to momentarily energize gas valve without energizing the welding circuit.

☞ *Jog and Purge only work on the active side of the feeder.*

Holding the Jog and Purge buttons at the same time displays pulse parameters on the side panel display and voltage on front panel display.

5-4. Side And Rear Panel Controls



1 Mode Display

2 Mode Select Button

Press button to move > in display.

3 Parameter Display

4 Parameter Select Button

Press button to move > in display.

5 Parameter Increase Button

6 Parameter Decrease Button

7 Power Switch

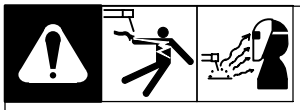
8 Circuit Breaker CB1

CB1 protects the wire feeder from overload.

Ref. ST-157 433-B / Ref. ST-155 223

SECTION 6 – SETTING SEQUENCE PARAMETERS

6-1. Sequence Parameters In A Program



☞ *See Menu Guide for detailed programming steps.*

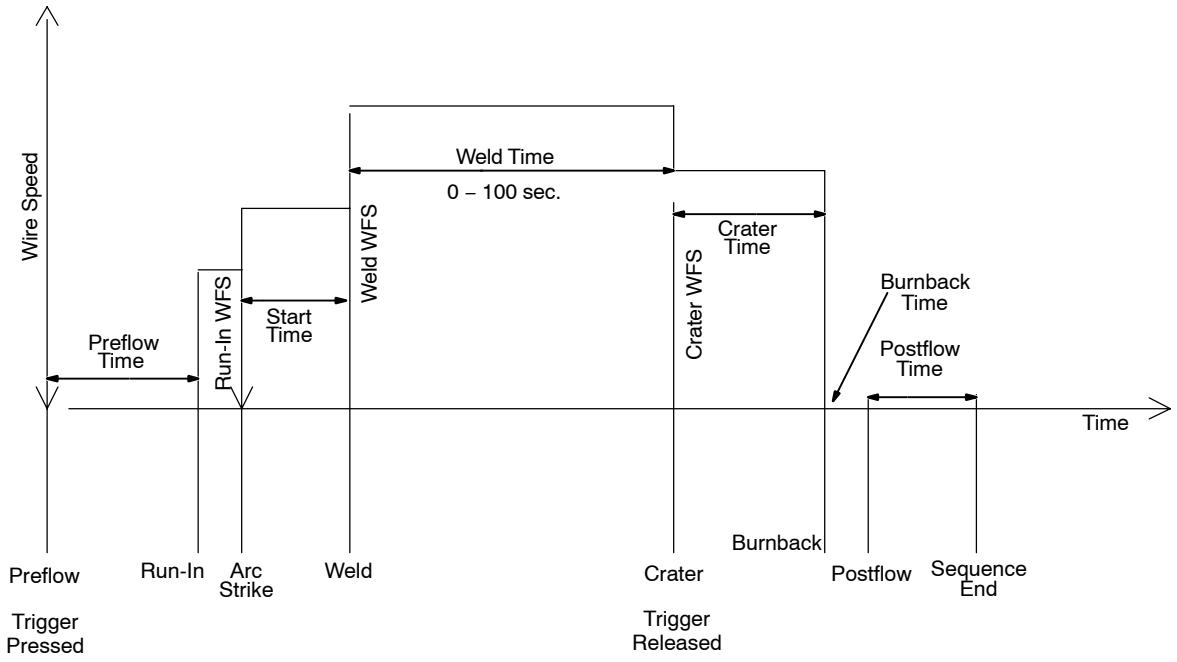
Trim is arc length. If set to zero, arc length is short. If set to 99, arc length is long.

If time is set to zero in Weld sequence, welding continues until gun trigger is released.

If time is set to zero in any timed sequence except Weld, the sequence is skipped.

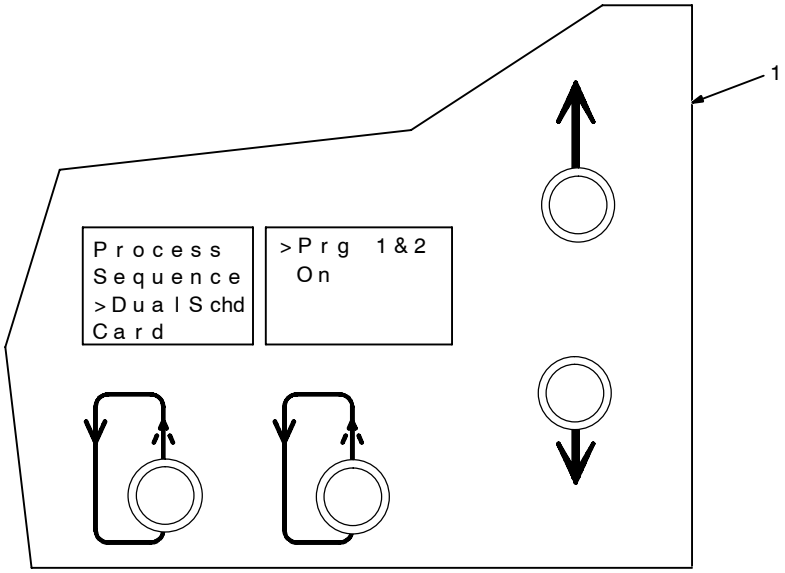
		Trim 0-99	Volts 10.0-38.0	Inductance 0-99%	IPM 50-780	Seconds
1. Weld	Pulse	X			X	0-100.0
	MIG		X	X	X	
2. Crater	Pulse	X			X	0-5.00
	MIG		X		X	
3. Burnback	Pulse					0-0.25
	MIG		X			
4. & 5. Postflow/ Preflow						0-9.9
6. Run-In					25-780	
6. Start	Pulse	X			X	0.00-5.00
	MIG		X		X	

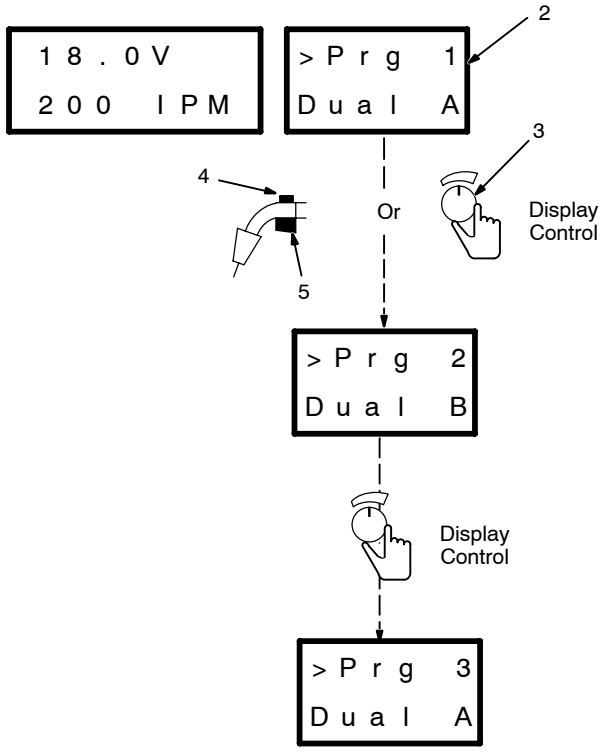
X = Setting available.



SECTION 7 – SETTING DUAL SCHEDULE PARAMETERS

7-1. Selecting Dual Schedule Pair





Dual Schedule is used with two consecutive weld programs 1 & 2, 3 & 4, 5 & 6, or 7 & 8. Any program type (MIG, Adaptive Pulse, or Pulse) can be combined in dual schedule.

1 Side Panel Display

Use side panel to turn feature on. See Menu Guide for detailed programming steps.

2 Front Panel Display

Press front panel parameter select button to select program number.

3 Front Panel Display Control

4 Dual Schedule Switch (See Section 7-2)

☞ *Switch type is set in System Setup.*

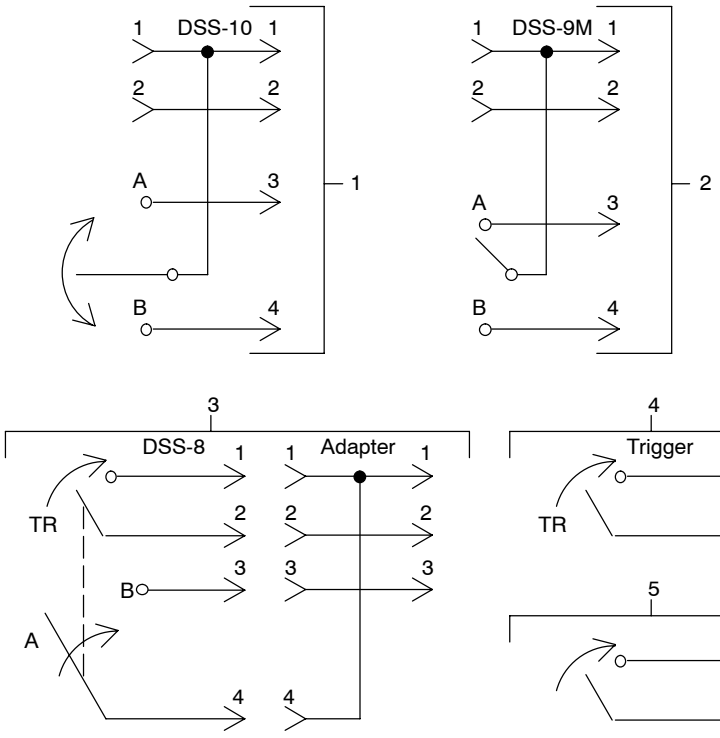
5 Welding Gun Trigger

Selecting dual schedule program A or B is done by using Display Control, dual schedule switch, or gun trigger (depending on system setup).

When program B is active, turn Display Control one click clockwise to select another pair of dual schedule programs.

☞ *Programs can be rearranged in desired order using the data card. See Section 8.*

7-2. Optional Dual Schedule Switch Diagrams



1 Momen 2P (Momentary-Contact 2-Pole Switch)

2 Maint 2P (Maintained-Contact 2-Pole Switch)

3 Maint 1P (Maintained-Contact 1-Pole Switch)

4 Trigger

Allows dual scheduling after establishing a welding arc.

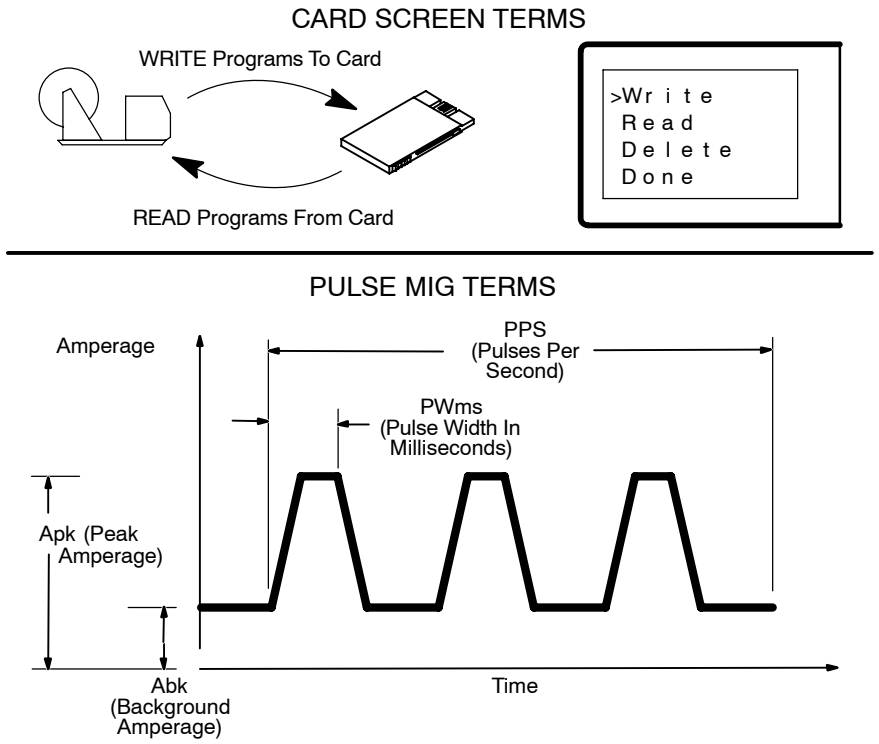
5 Momen 1P (Momentary-Contact 1-Pole Switch)

☞ *If trigger is used for dual schedule switch, Trigger Hold is disabled.*

☞ *Switch type is selected in system setup (see Section 9).*

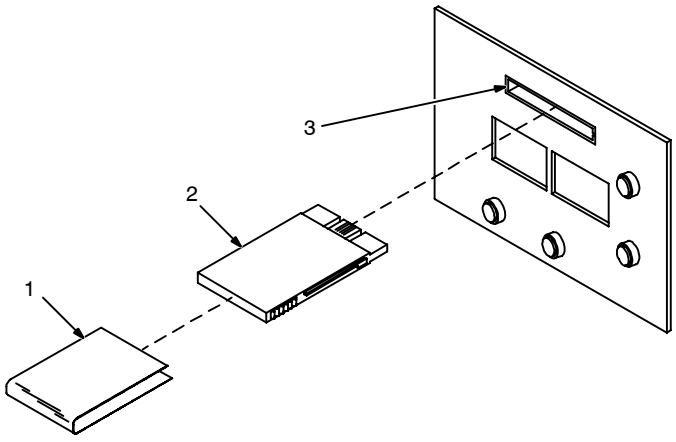
SECTION 8 – USING THE OPTIONAL DATA CARD

8-1. Data Card Terms



SA-158 435

8-2. Installing Data Card



1 Label

Apply label to data card. Write program information on label.

2 Data Card

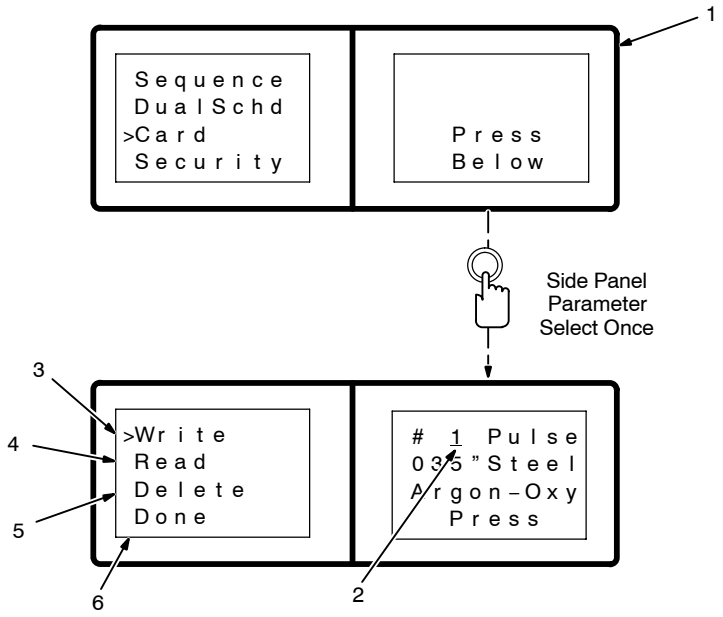
3 Card Slot

For Blank Data Card:

Insert card into slot. To format card, turn On power. Select Card from menu. Data card formats when unit enters Card mode.

ST-156 266-B

8-3. Card Displays



☞ *See Menu Guide for detailed programming steps. Security mode only functions with a data card.*

1 Card Display

2 Moving Line

Moving line is under value that can be changed.

3 Write

Transfers program data from unit to card. The program card can hold up to 32 programs. When writing to the card, the next available program number is automatically assigned.

4 Read

Transfers program data from card to unit.

5 Delete

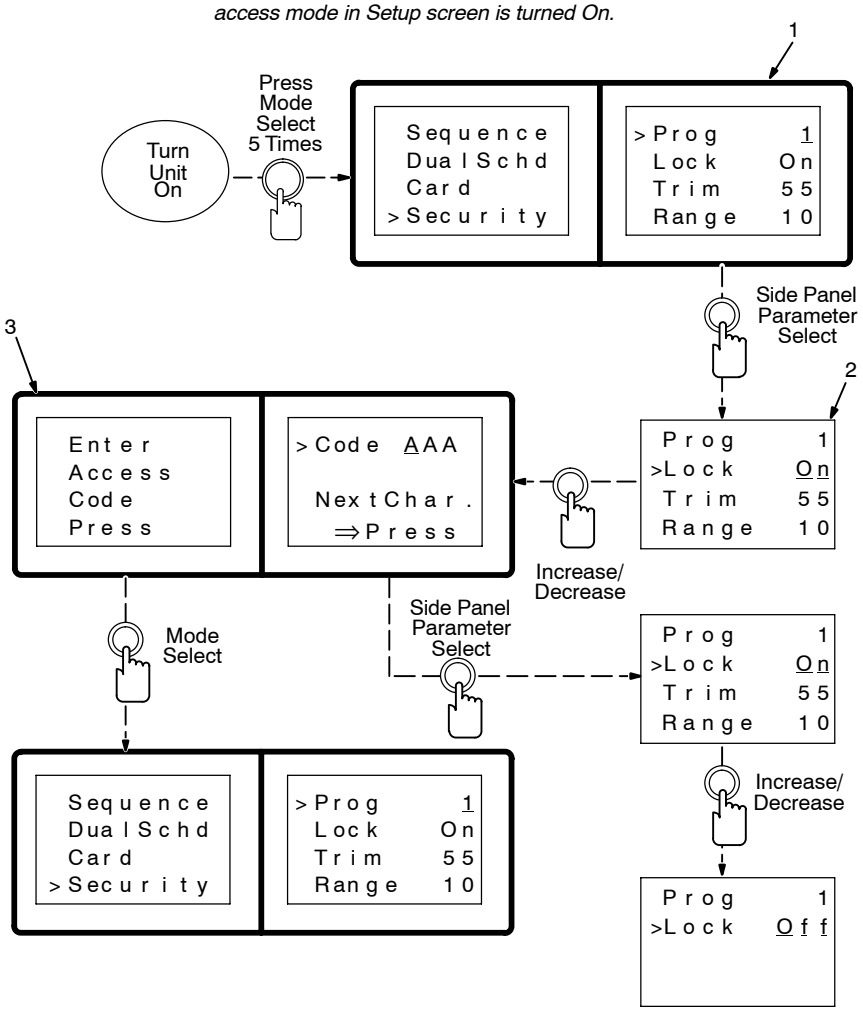
Deletes program data from card.

6 Done

Exits card display.

8-4. Entering Access Code

☞ *Access code works only when a data card is inserted and access mode in Setup screen is turned On.*



1 Security Display

2 Program Lock Display

3 Access Code Display

With a code set, this display appears when trying to turn off a program lock.

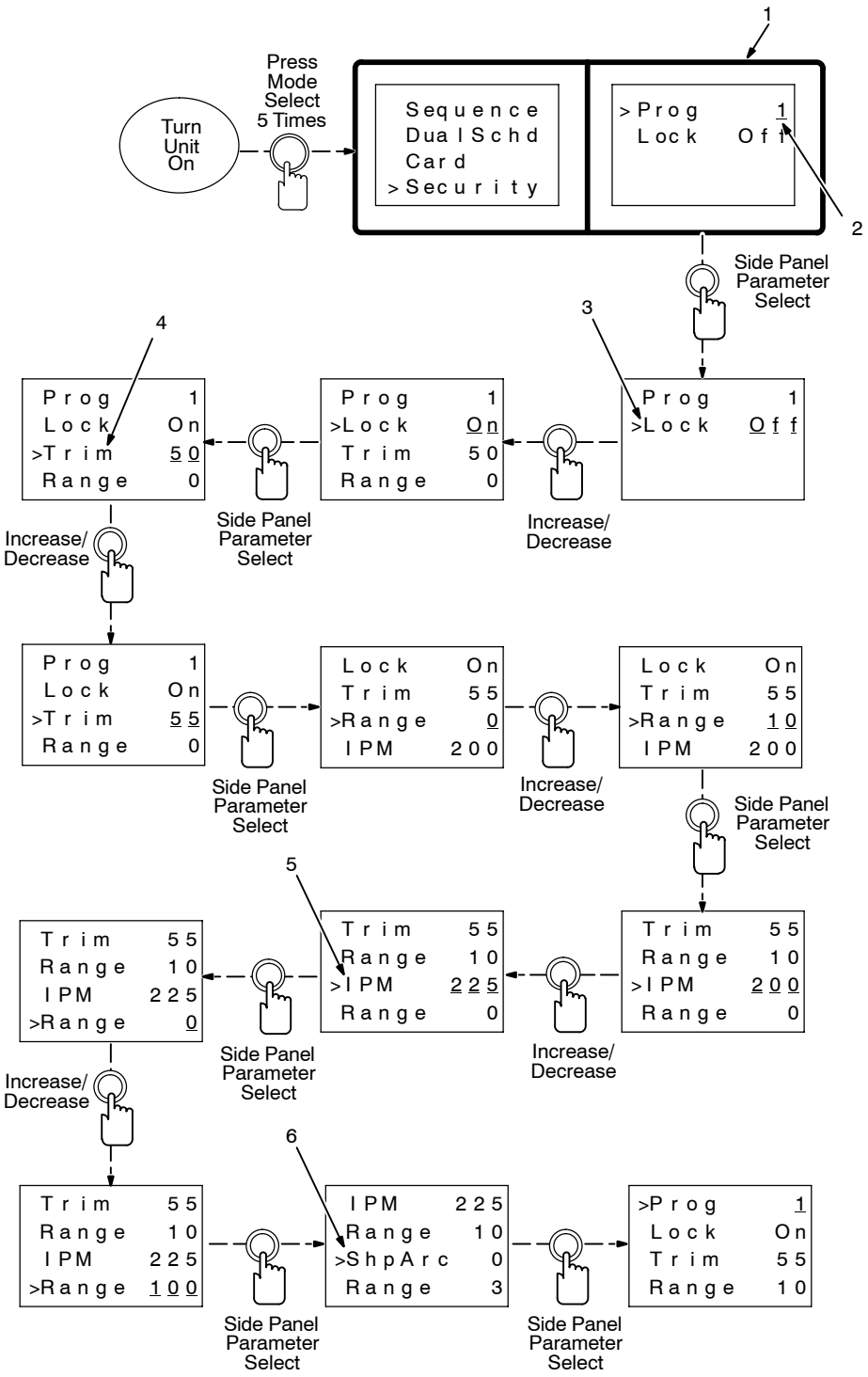
Pressing Mode Select button will exit the access code display.

☞ *If any character is incorrect during code entry, pressing side panel Parameter Select button will cause the indicator to move back to beginning of character set to allow entering access code again.*

Press side panel Parameter Select button to enter access code. When the correct letter is entered, pressing side panel Parameter Select button moves indicator to the next character. When the final access code character is entered, press side panel Parameter Select button to automatically change display to the program lock display.

8-5. Security

☞ *The security feature works only when a data card is inserted.*



The security feature allows a minimum and maximum range limit to be defined for Trim, inches per minute (IPM), and ShpArc (see Section 12).

When the security lock is Off, the full range of values is available for each parameter.

When the security lock is On, the range of values available for each parameter is the defined value plus or minus the defined range.

For example, if the IPM value is defined as 125, and the range is defined as 50, the actual range of available IPM is 75 to 175 IPM (125 minus 50, and 125 plus 50).

1 Card Display

2 Moving Line

Moving line is under value that can be changed. Change program number to access desired program.

3 Lock On/Off

Toggles security feature On or Off. Definable values are displayed when Lock On is selected. Use side panel controls to change values.

4 Trim And Range Display

5 IPM And Range Display

6 ShpArc And Range Display

Definable Values (Standard Motor):

Trim: 0–99 Range: 0–99

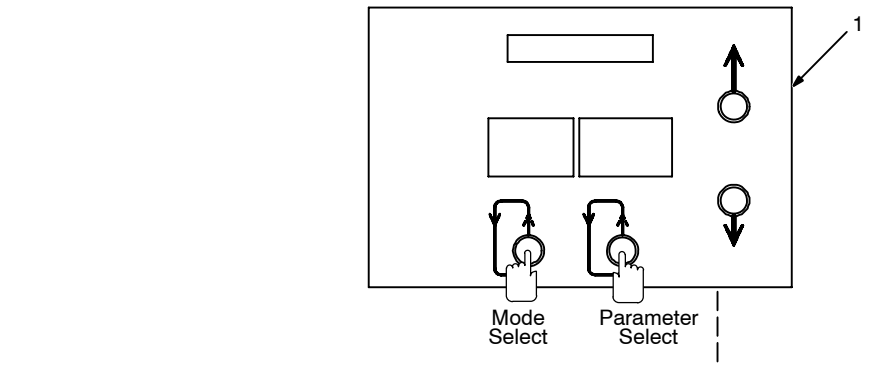
IPM: 50–780 Range: 0–780

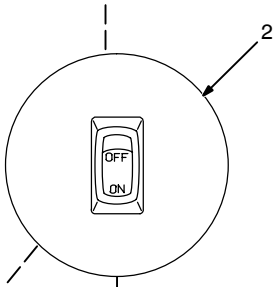
ShpArc : 0–20 Range: 0–20

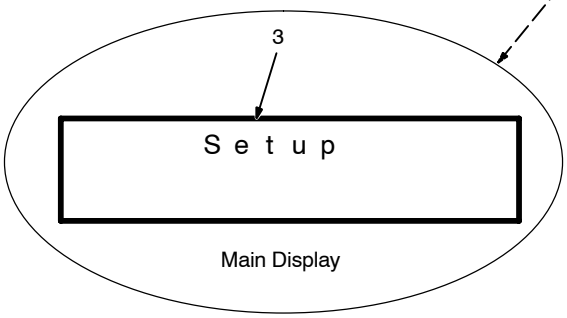
In the example displays, the operator could change the value of Trim to 55 and its Range to ±10. Also, the operator could change the value of IPM to 225 and its Range to ±100 IPM from programmed values. If the range settings are left at 0, the operator cannot change values from those programmed.

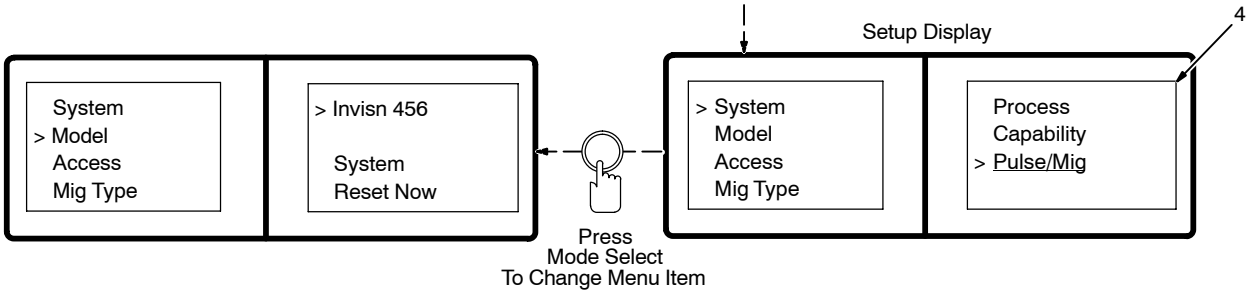
SECTION 9 – SYSTEM SETUP

9-1. Accessing The Setup Menu









1 Setup Panel

2 Power Switch

Press and hold down both buttons while turning On unit.

3 Main Display

Main display during setup.

4 Setup Display

Follow this procedure any time access is required. Once in the setup displays, use the Mode Select button to select a particular display.

See Section 9-2 System Setup Display Parameters

9-2. System Setup Display Parameters

Note ☞ *See Menu Guide for detailed programming steps.*

DISPLAY SETTING	NOTES
>System	Select the process the welding power source is able to do.
>Model	For the Invision 456 and XMT 304 selections, pulse data and welding power source minimum and maximum voltage values are automatically loaded in. For the “Other” selection, welding power source minimum and maximum voltage and amperage values must be entered. Pulse data defaults to Invision 456 values.
>Access♦	When on, restricts use of setup screens.
>Mig Type	Default is Off. Set to On only for older CV welding power source without voltage feedback at 14-socket receptacle.
>Voltage	Default is 14-pin receptacle. Use V. Sense when more than 50 ft (15m) of weld cable is used (including gun cable length).
>Arc Start*	Use Hot Start only with Inverter Model welding power source and large diameter wires. The arc starts in CV and switches to CC.
>Dual Schedule	See Section 7-2.
>Trigger	When on, trigger can be used to switch between programs that have at least 0.2 seconds of preflow time programmed.
>Remote	When on, an optional dual schedule switch with a “y” trigger cable adapter cord can be used to change Volts or Trim, IPM, SharpArc, or Prg depending on where the front panel display > is.
>Arc Time	Displays accumulated arc time and cycles.
>Wire Feed	Choose to display inches per minute or meters per minute and motor type, but installed motor must match selection.
>Memory	No Reset: allows operator to exit memory reset parameter without resetting any data. Program Reset: unit defaults to original factory setting for the last active program. Setup information does not change. If setup card is in card slot, program will be loaded from card. System Reset: unit defaults to original factory settings for all programs and setup excluding System and Arc Time. If setup card is in card slot, program will be loaded from card. Total Reset: unit defaults to original factory settings for all programs and setup including System and Arc Time. If setup card is in card slot, program will be loaded from card.
>Shutdown	When on, the system immediately shuts down if no arc voltage is sensed. When off, wire feeds even if no arc voltage is sensed.
>Gas Flow♦♦	Setting must be Meter Off if option is not installed.
>Ramps	Turns start and crater ramping On or Off. When On, output power is tapered from start to weld and from weld to crater.
>Software	Know this when talking with service personnel.

♦ Can be used only when optional data card is inserted.
*Selection does not appear on display when MIG Only is System choice.
♦♦ Must remain set to Meter Off if option is not installed to prevent system error.

SECTION 10 – STANDARD PULSE WELDING PROGRAMS FOR PHOENIX/INVISION 456 INVERTER WELDING POWER SOURCES

Note ☞ *Apk = Peak Amperage, Vpk = Peak Voltage, Abk = Background Amperage, PPS = Pulses Per Second, PWms = Pulse Width (milliseconds). The following eight pulse welding programs are in the memory of the wire feeder. Use this information if it is necessary to change a standard program, or as a basis to build your own custom program. If at any time while changing a standard program, or while building your own custom program, you want to go back to the standard program in the wire feeder, perform a system reset according to Section 9-2.*

10-1. Program 1 – Steel

Wire Size/Type: .035”			**Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	440	36.7	160	180	2.9	
400 / 10.2	385	32.4	108	126	2.3	
200 / 5.1	335	28.7	61	81	2.0	
100 / 2.5	328	27.4	37	47	1.7	

10-2. Program 2 – Steel

Wire Size/Type: .045”			**Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	518	35.0	195	205	3.6	
400 / 10.2	466	31.3	147	158	2.9	
200 / 5.1	412	28.5	93	106	2.4	
100 / 2.5	375	26.5	50	66	2.2	

10-3. Program 3 – Steel

Wire Size/Type: .052”			**Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
625 / 15.9	560	39.3	200	229	3.6	
400 / 10.2	525	36.2	148	189	3.5	
200 / 5.1	475	31.7	102	131	2.7	
100 / 2.5	445	29.6	50	80	2.4	

10-4. Program 4 – Steel

Wire Size/Type: .062”			Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
400 / 10.2	550	36.8	200	195	4.1	
300 / 7.6	510	36.3	145	175	3.8	
200 / 5.1	480	31.6	110	155	3.2	
100 / 2.5	460	28.7	69	94	2.6	

10-5. Program 5 – Stainless Steel

Wire Size/Type: .035”			Gas: Ar - He - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	403	33.9	132	191	2.8	
400 / 10.2	318	31.6	87	146	2.4	
200 / 5.1	295	28.5	53	94	1.9	
100 / 2.5	280	26.0	32	45	1.8	

10-6. Program 6 – Stainless Steel

Wire Size/Type: .045”			Gas: Ar - He - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	480	39.0	200	227	3.2	
400 / 10.2	425	32.4	155	185	2.5	
200 / 5.1	360	28.0	100	115	2.0	
100 / 2.5	350	26.2	40	70	2.0	

10-7. Program 7 – Metal Core

Wire Size/Type: .045” Metal Core			Gas: Ar - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	490	37.4	165	210	3.1	
400 / 10.2	440	33.8	115	155	2.5	
200 / 5.1	400	29.2	70	120	1.9	
115 / 2.9	395	26.3	41	96	1.4	

10-8. Program 8 – Metal Core

Wire Size/Type: .052” Metal Core			Gas: Ar - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	510	38.0	240	250	3.3	
400 / 10.2	460	33.3	135	200	2.5	
250 / 6.4	425	31.0	100	170	2.2	
175 / 4.4	410	28.6	75	155	1.9	

SECTION 11 – STANDARD PULSE WELDING PROGRAMS FOR XMT 304 INVERTER WELDING POWER SOURCES

Note ☞ *Apk = Peak Amperage, Vpk = Peak Voltage, Abk = Background Amperage, PPS = Pulses Per Second, PWms = Pulse Width (milliseconds). The following eight pulse welding programs are in the memory of the wire feeder. Use this information if it is necessary to change a standard program, or as a basis to build your own custom program. If at any time while changing a standard program, or while building your own custom program, you want to go back to the standard program in the wire feeder, perform a system reset according to Section 9-2.*

11-1. Program 1 – Steel

Wire Size/Type: .030”		**Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**				
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	400	37.2	127	137	1.8	
400 / 10.2	340	33.3	94	98	1.6	
200 / 5.1	305	29.6	58	63	1.4	
100 / 2.5	285	27.7	32	36	1.4	

11-2. Program 2 – Steel

Wire Size/Type: .035”		**Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**				
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	400	34.9	170	188	2.2	
400 / 10.2	400	32.5	95	113	1.9	
200 / 5.1	370	29.9	53	70	1.7	
100 / 2.5	350	29.7	26	40	1.7	

11-3. Program 3 – Steel

Wire Size/Type: .045”		**Gas: Ar - CO_2 or Ar - Oxy / 40 CFH (19 L/m)**				
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
500 / 12.7	400	32.0	200	200	3.5	
400 / 10.2	400	31.0	165	165	3.0	
200 / 5.1	375	29.0	97	97	2.5	
100 / 2.5	366	27.4	54	50	2.1	

11-4. Program 4 – Stainless Steel

Wire Size/Type: .030”			Gas: Ar - He - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	350	34.1	102	130	1.8	
400 / 10.2	315	31.7	70	94	1.7	
200 / 5.1	280	30.1	50	46	1.5	
100 / 2.5	265	29.9	26	25	1.4	

11-5. Program 5 – Stainless Steel

Wire Size/Type: .035”			Gas: Ar - He - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	385	35.8	106	163	2.3	
400 / 10.2	370	32.9	57	137	2.0	
200 / 5.1	316	29.7	39	95	1.5	
100 / 2.5	311	29.1	30	41	1.4	

11-6. Program 6 – Stainless Steel

Wire Size/Type: .045”			Gas: Ar - He - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
700 / 17.8	400	34.2	200	275	2.8	
400 / 10.2	395	33.1	123	158	2.6	
200 / 5.1	370	30.9	75	104	2.1	
100 / 2.5	337	28.2	40	70	1.9	

11-7. Program 7 – Nickel Alloy

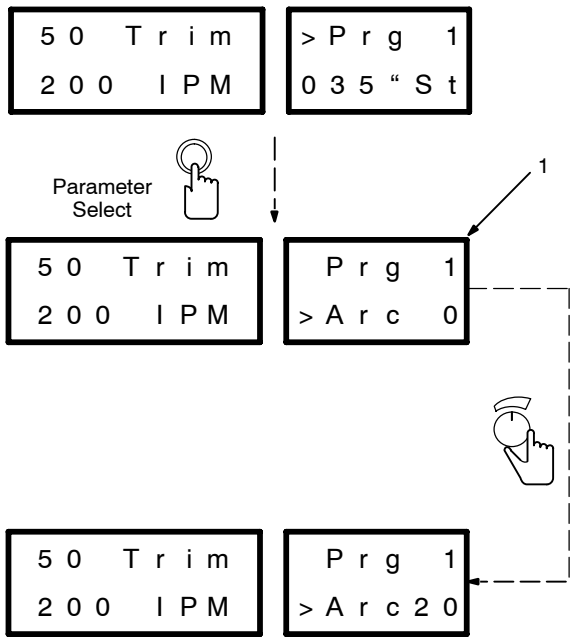
Wire Size/Type: .035” Nickel Alloy			Gas: Ar - He / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
625 / 15.9	400	32.5	128	145	3.5	
400 / 10.2	370	30.1	94	92	3.3	
200 / 5.1	299	27.8	56	65	2.9	
125 / 3.2	256	25.6	40	40	2.8	

11-8. Program 8 – Metal Core

Wire Size/Type: .045” Metal Core			Gas: Ar - CO_2 / 40 CFH (19 L/m)			
IPM / MPM	**Apk**	**Vpk**	**Abk**	**PPS**	**PWms**	**COMMENTS**
625 / 15.9	400	34.0	200	220	2.8	
500 / 12.7	400	34.0	155	190	2.6	
300 / 7.6	370	31.3	105	140	2.4	
150 / 3.8	352	27.7	60	108	1.7	

SECTION 12 – SETTING SharpArc™ CONTROL

12-1. Selecting And Adjusting SharpArc™ Control



1 Arc

SharpArc™ is “Arc” on the display. It is used to adjust arc cone width and arc characteristics.

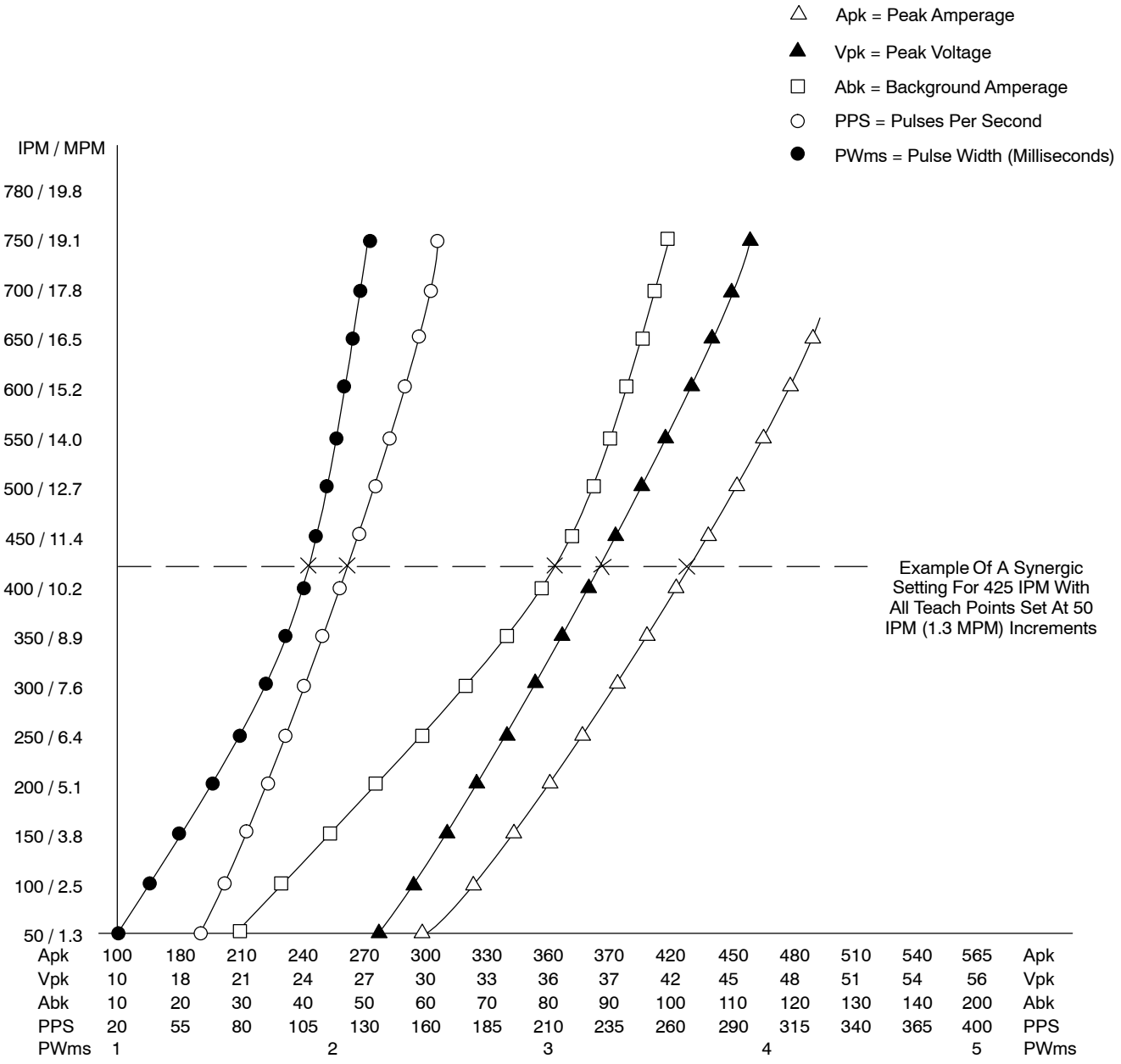
Use front panel parameter select button to move > to select Arc. Use Display Control to adjust Arc setting.

SharpArc™ setting range is from 0 to 20. The factor default is set at zero (0). When Arc value is increased toward 20, the arc cone narrows and the weld puddle becomes less fluid.

Ref. S-0259

SECTION 13 – TEACH POINTS

13-1. Teach Using 15 Points



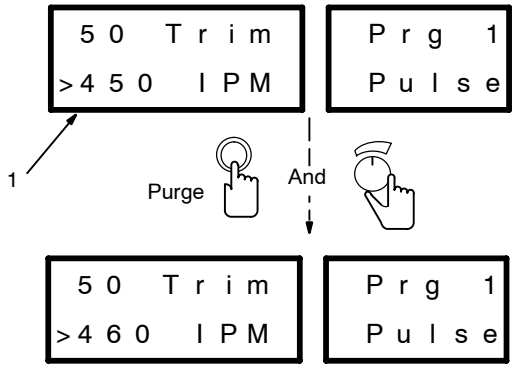
The teach mode allows the user to create custom pulse programs. The teach mode selection for 15 teach points gives a more defined curve for a specific range. At each teach point, the user can adjust five parameters to shape the pulse waveform of the weld output. The six parameters are: IPM (MPM), Apk, Vpk, Abk, PPS, and PWms.

Apk, Vpk, Abk, PPS, and PWms acting together provide the energy necessary to burn off welding wire at a set wire feed speed. The graph below shows that as wire feed speed increases, energy increases (Apk, Vpk, Abk, PPS, and PWms acting synergically).

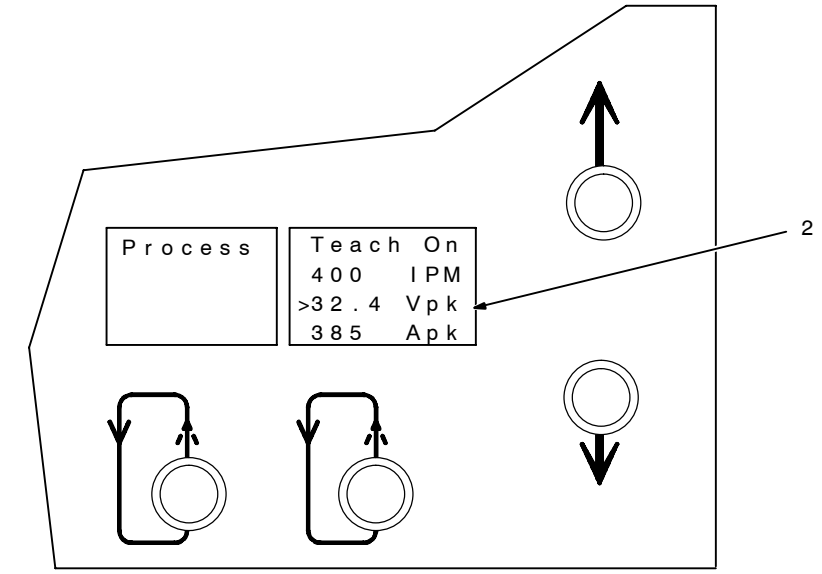
Under some conditions, the wire feeder limits wire feed speed to maintain all pulse parameters within the capability of the system.

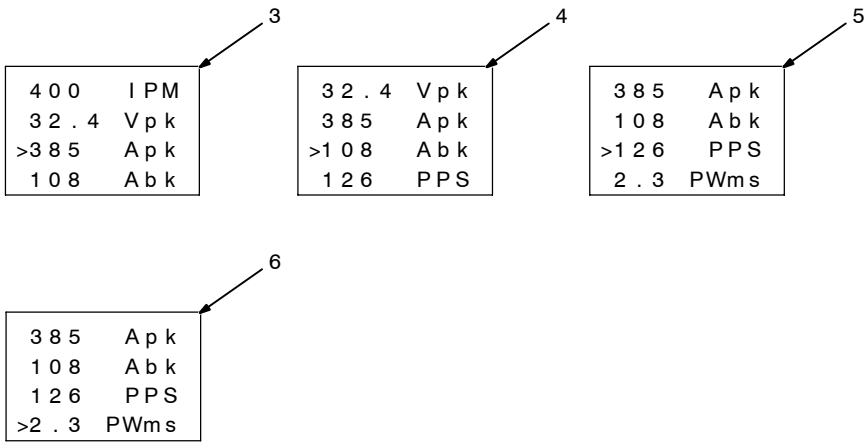
13-2. Redefining Teach Points

Redefining IPM Teach Point



Redefining Pulse Parameters





1 IPM

IPM determines the weld metal deposition rate.

☞ *Redefining IPM is not normally required unless special wire or unusual joint design is needed.*

Use front panel parameter select button to move > to select IPM. Use Display Control to select teach point value.

Press and hold Purge button while turning Display Control to redefine the ipm teach point. For example: there are teach points at 150, 200, and 250 ipm; the teach point at 200 can be adjusted to a wire feed speed of 151 to 249 ipm.

2 Vpk – Peak Voltage

Arc voltage during peak current phase of the pulse waveform. This determines arc length during adaptive pulse welding.

3 Apk – Peak Amperage

4 Abk – Background Amperage

Peak and background amperage depend on the range of the welding power source.

5 PPS – Pulses Per Second Of 20-400

6 PWms – Pulse Width Of 1.0-5.0 Milliseconds

Use side panel controls to change pulse parameters. See Menu Guide for detailed programming steps.

After values are set, strike and maintain an arc for five seconds. Do this for each teach point.

End weld by releasing gun trigger, not by pulling gun out of weld. Repeat for each custom teach point.

The taught arc length represents a Trim (arc length) setting of 50.

Once the teach points are set, the wire feeder adjusts parameters between teach points synergically.

Ref. S-0259 / Ref. ST-154 109

Date_____ **Program Number**_____ **Wire Size/Type**_____

Wire Manufacturer_____ **Mfg. Date**_____

Gas_____ **Flowrate**_____**CFH(L/min)**

Equipment Used – Power Source_____ **Serial Number**_____

Wire Feeder_____ **Serial Number**_____

Gun Model_____ **Weld Cable – Negative**_____ **Positive**_____

IPM / MPM	Vpk	Apk	Abk	PPS	PWms	COMMENTS

Preflow Seconds:_____ **Run In IPM:**_____ **Ramps/Start:**_____ **Crater:**_____

Start Trim/Volts:_____ **IPM / MPM:**_____ **Seconds:**_____

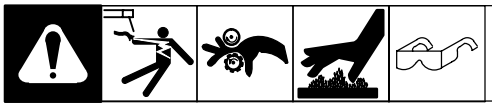
Crater Trim/Volts:_____ **IPM / MPM:**_____ **Seconds:**_____

Burnback Volts/Seconds:_____ **Postflow Seconds:**_____

SharpArc:_____ **Arc Start:**_____ **Trim:**_____

SECTION 14 – MAINTENANCE AND TROUBLESHOOTING

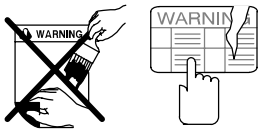
14-1. Routine Maintenance



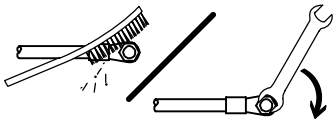
▲ **Disconnect power before maintaining.**

3 Months

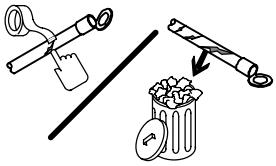
Replace unreadable labels.



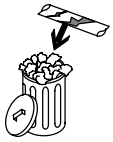
Clean and tighten weld terminals.



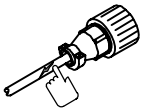
Repair or replace cracked weld cable.



Replace cracked parts.

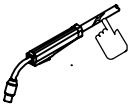


Check 14-pin cord.



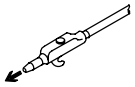
Check gas hose and fittings.

Check gun cable.

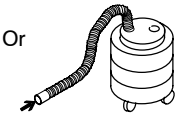


6 Months

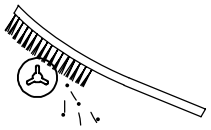
Blow out or vacuum inside. During heavy service, clean monthly.



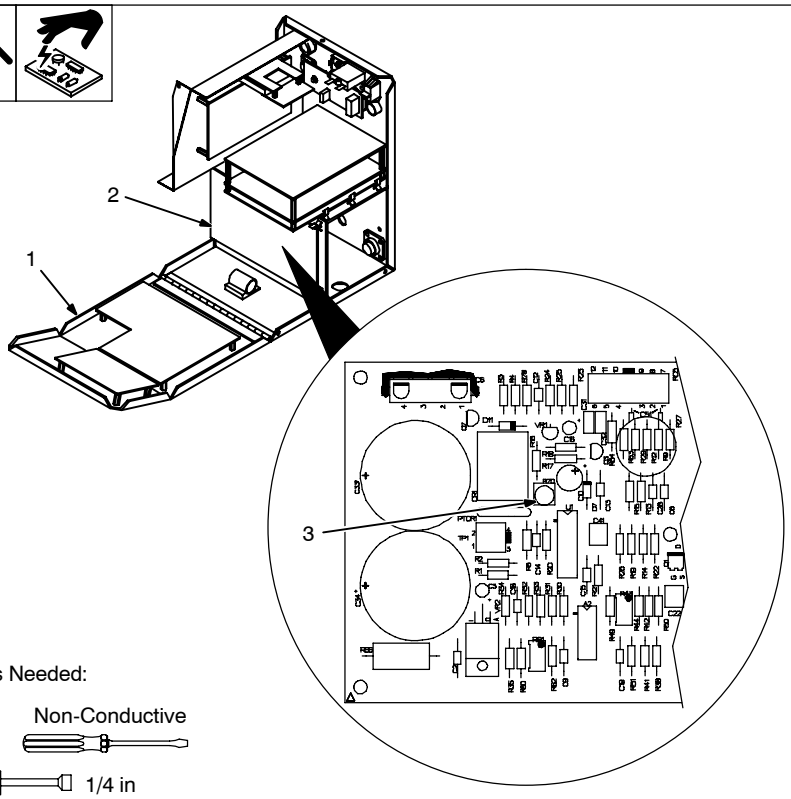
Or



Clean drive rolls.



14-2. Motor Start Control



To change wire feed starting speed proceed as follows:

Turn Off unit and welding power source.

Remove wrapper.

1 Front Panel

Remove screw from upper left corner, and open hinged front panel.

2 Motor Board PC1

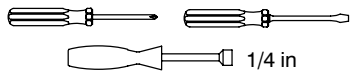
3 Motor Start Control Potentiometer R70

Rotate potentiometer clockwise to increase time it takes the motor to ramp up to speed. Remove protective white rubber cap before making adjustment. Adjust potentiometer R70 using a small nonconductive screwdriver.

Close and secure front panel, and reinstall wrapper.

Tools Needed:

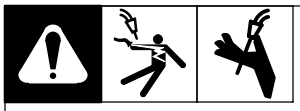
Non-Conductive

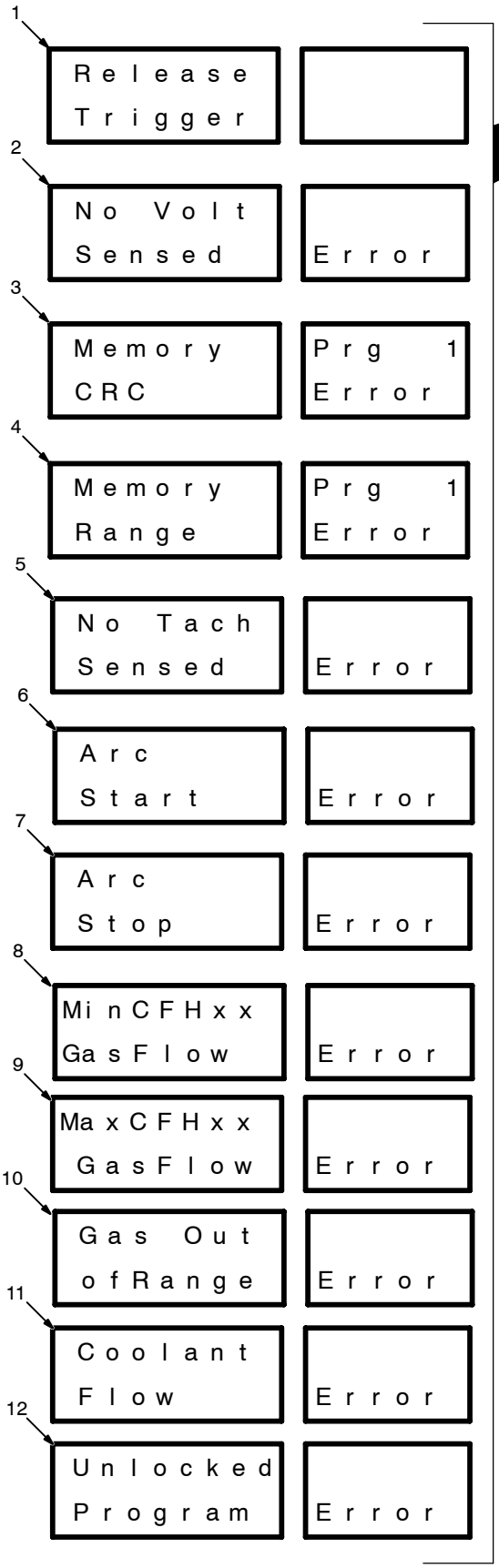


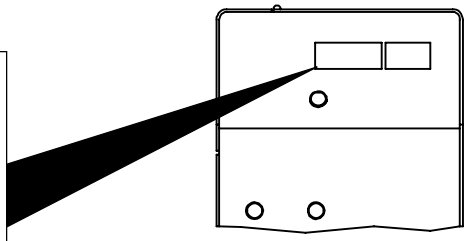
1/4 in

ST-157 480-A / Ref. SA-183 121-B

14-3. Error Displays







1 Release Trigger Error Display

This appears if the trigger is closed when the unit power is turned on, or if the trigger is stuck or defective.

2 No Volt Sensed Error Display

The arc voltage sense circuit is not receiving feedback. Check voltage sensing connections. Check connections at 14-position plugs/ receptacles at the unit and welding power source.

Turn unit off and back on after correcting problem.

If this error continues to occur when pulse welding, it may help to select Hot Start.

3 Memory CRC Error Display

The data in the program indicated is not the same data that was saved.

Perform a system reset.

4 Memory Range Error Display

The data in the program indicated is out of usable range.

Go through pulse parameters to make sure they do not exceed settings of the Range display or perform a system reset.

5 No Tach Sensed Error Display

The motor tach feedback is not reaching the control. Check connections.

Press front panel Parameter Select to clear error.

6 Arc Start Error Display

This appears when pulse welding and current is detected but the arc cannot be started. Check and correct program pulse parameters and voltage settings. Check voltage sensing connections.

Press front panel Parameter Select to clear error.

7 Arc Stop Error Display

This appears when pulse welding and the motor does not stop at the end of the weld. If there is high frequency being used in the area, turn it off. A motor brake circuit problem can also cause this error.

Press front panel Parameter Select to clear error.

8 Minimum Gas Flow Error

This appears when gas flow falls below the minimum CFH set (xx in example). Adjust gas flow to bring it above set value.

Press front panel Parameter Select to clear error.

9 Maximum Gas Flow Error

This appears when gas flow is above the maximum CFH set (xx in example). Adjust gas flow to bring it below set value.

Press front panel Parameter Select to clear error.

10 Gas Out Of Range Error

This appears when gas flow is greater than 100 CFH. To protect the internal sensor, the unit shuts down until the gas flow can be adjusted below 100 CFH.

11 Coolant Flow Error

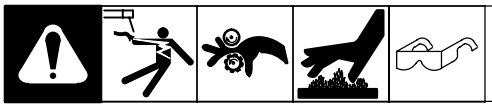
This appears only when coolant flow switch option is installed. Check coolant recirculating system.

12 Unlocked Program Error Display

This appears when attempting to run an unlocked program while other programs are locked. Either lock the unlocked program or select a different program that is locked.

Ref. ST-155 222

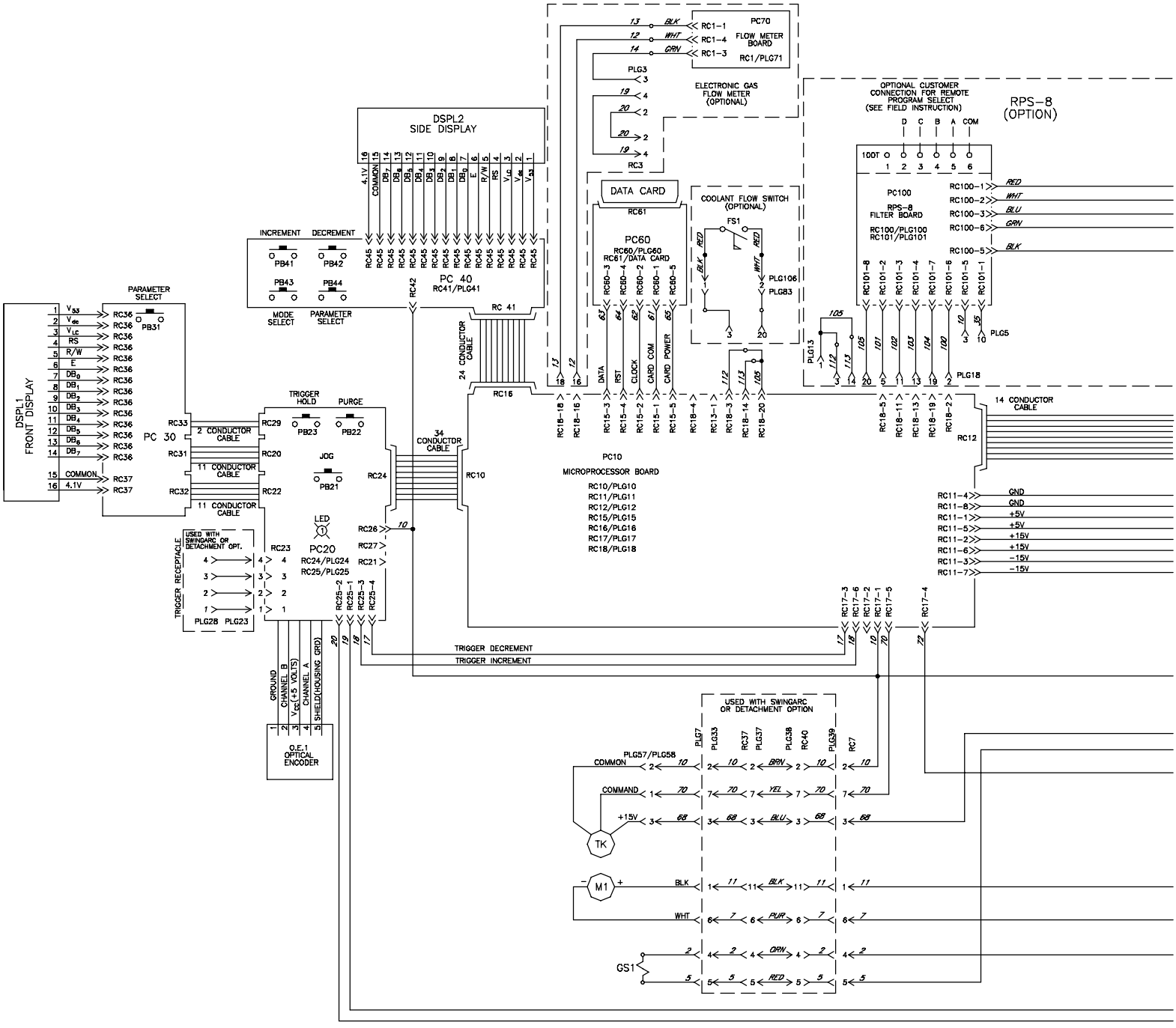
14-4. Troubleshooting



▲ **Disconnect power before troubleshooting**

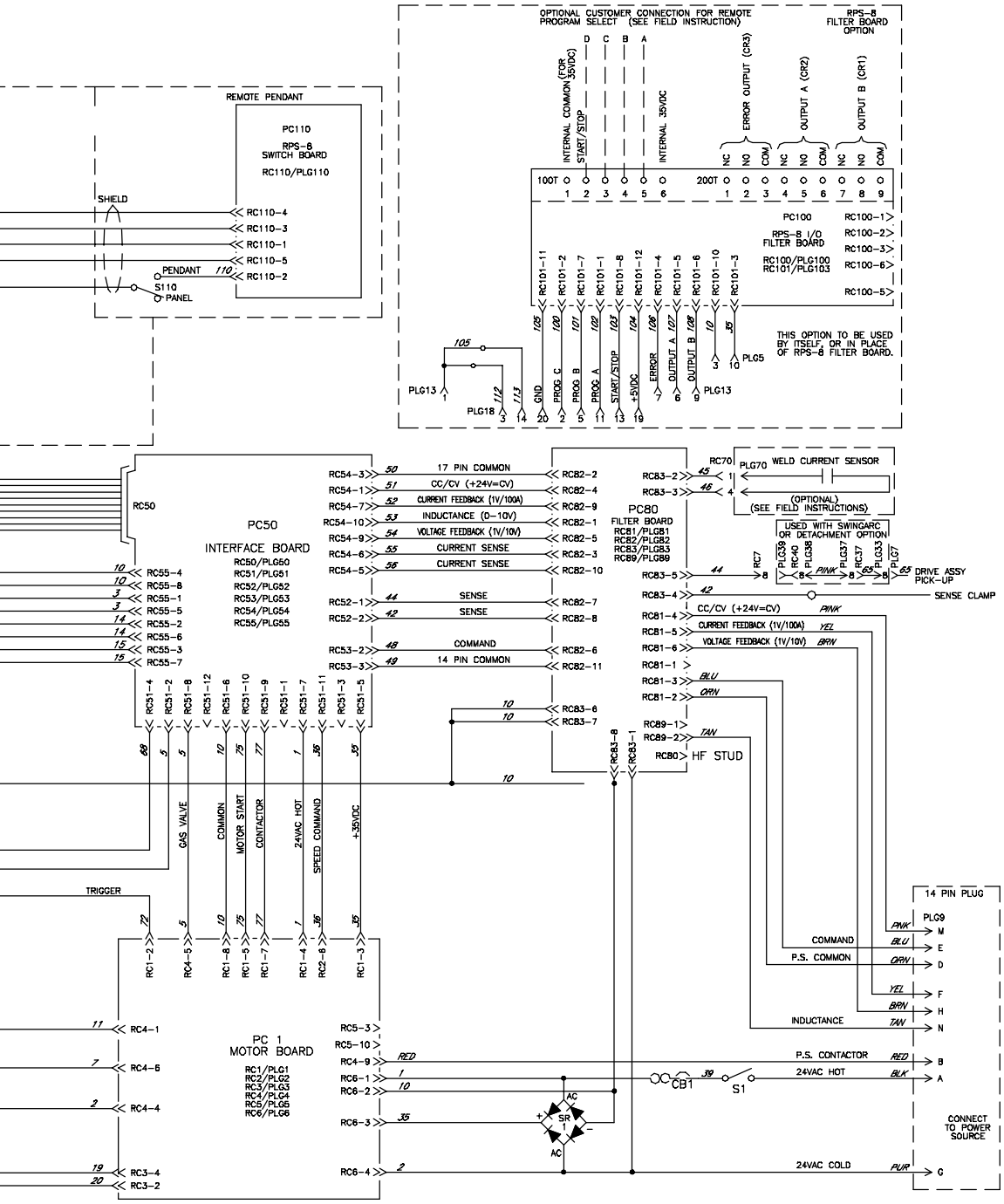
Trouble	Remedy
Wire feeds, shielding gas flows, but electrode wire is not energized.	Check interconnecting cord connections. If secure, check cord for continuity and repair or replace (see Sections 4-5 and 4-7).
Wire feeder is on, meter(s) do not light up, motor does not run, gas valve and welding power source contactor do not pull in.	Check and reset CB1 (see Section 5-4).
Electrode wire feeding stops or feeds erratically during welding.	Check gun trigger connection. See gun Owner's Manual.
	Check gun trigger. See gun Owner's Manual.
	Readjust hub tension and drive roll pressure (see Section 4-12).
	Change to correct size drive roll (see Table 16-1).
	Clean or replace dirty or worn drive roll.
	Incorrect size or worn wire guides.
	Replace contact tip or liner. See gun Owner's Manual.
	Remove weld spatter or foreign matter from around nozzle opening.
	Have Factory Authorized Service Agency check drive motor or motor control board PC1.
Motor runs slowly.	Check for correct input voltage.
Wire does not feed until trigger is pulled, but continues to feed after trigger is released, and trigger hold is not on.	Check for a short between welding gun trigger leads and weld cable. Repair short or replace welding gun.
Gas valve in feeder is rattling loudly along with possible erratic or slow wire feed speed.	Check for a short between welding gun trigger leads and weld cable. Repair short or replace welding gun.
Unit does not switch out of Run-In Speed.	Install, reconnect, or replace voltage sensing lead.
Wire feeder power is on, displays light up, but unit is inoperative.	Check welding gun trigger leads for continuity, and repair leads or replace gun.

SECTION 15 – ELECTRICAL DIAGRAM



⚠ WARNING	• Do not touch live electrical parts. • Disconnect input power or stop engine before servicing. • Do not operate with covers removed. • Have only qualified persons install, use, or service this unit.
ELECTRIC SHOCK HAZARD	

Figure 15-1. Circuit Diagram


OPTIONAL CUSTOMER CONNECTION FOR REMOTE PROGRAM SELECT (SEE FIELD INSTRUCTION)
RPS-8 FILTER BOARD OPTION
REMOTE PENDANT
PC110
RPS-8 SWITCH BOARD
RC110/PLG110
SHIELD
PENDANT
S110
PANEL
INTERNAL COMMON (FOR 35VDC)
START/STOP
INTERNAL 35VDC
ERROR OUTPUT (CR3)
OUTPUT A (CR2)
OUTPUT B (CR1)
NC NO COM
100T
200T
PC100
RPS-8 I/O FILTER BOARD
RC100/PLG100
RC101/PLG103
THIS OPTION TO BE USED BY ITSELF, OR IN PLACE OF RPS-8 FILTER BOARD.
PLG5
PLG13
PLG18
GND
PROG C
PROG B
PROG A
START/STOP
+5VDC
ERROR
OUTPUT A
OUTPUT B
RC50
PC50
INTERFACE BOARD
RC50/PLG50
RC51/PLG51
RC52/PLG52
RC53/PLG53
RC54/PLG54
RC55/PLG55
17 PIN COMMON
CC/CV (+24V=CV)
CURRENT FEEDBACK (1V/100A)
INDUCTANCE (D-10V)
VOLTAGE FEEDBACK (1V/10V)
CURRENT SENSE
CURRENT SENSE
SENSE
SENSE
COMMAND
14 PIN COMMON
PC80
FILTER BOARD
RC81/PLG81
RC82/PLG82
RC83/PLG83
RC89/PLG89
RC70
PLG70 WELD CURRENT SENSOR
(OPTIONAL)
(SEE FIELD INSTRUCTIONS)
USED WITH SWINGARC OR DETACHMENT OPTION
DRIVE ASSY PICK-UP
SENSE CLAMP
CC/CV (+24V=CV)
CURRENT FEEDBACK (1V/100A)
VOLTAGE FEEDBACK (1V/10V)
RC80
HF STUD
GAS VALVE
COMMON
MOTOR START
CONTACTOR
24VAC HOT
SPEED COMMAND
+35VDC
TRIGGER
14 PIN PLUG
PLG9
COMMAND
P.S. COMMON
INDUCTANCE
P.S. CONTACTOR
24VAC HOT
24VAC COLD
CONNECT TO POWER SOURCE
PC 1
MOTOR BOARD
RC1/PLG1
RC2/PLG2
RC3/PLG3
RC4/PLG4
RC5/PLG5
RC6/PLG6
CB1
S1
SR
AC
AC

SD-183 495-B

☞ *Hardware is common and not available unless listed.*

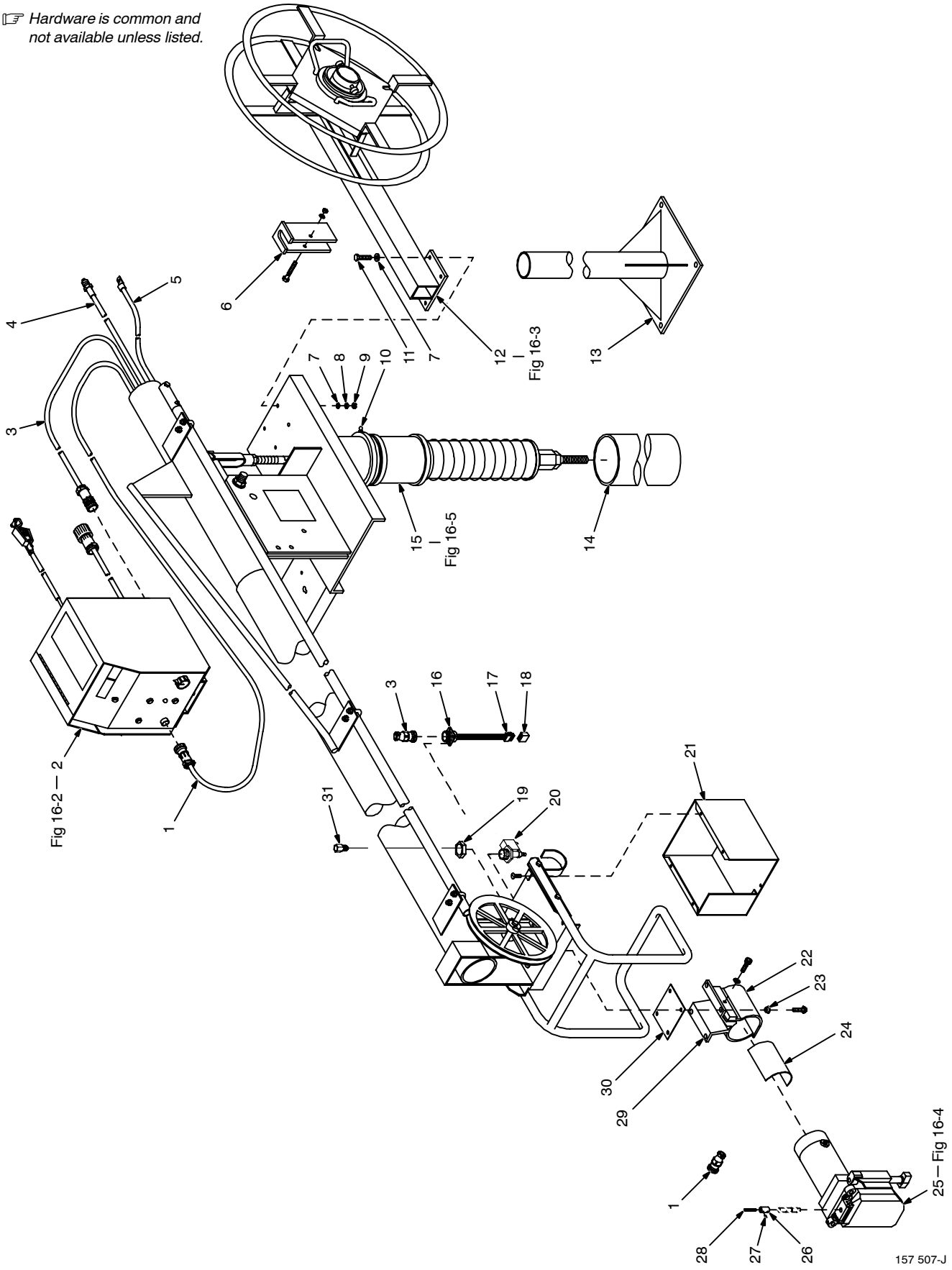


Figure 16-1. Main Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model 12	Quantity Model 16

Figure 16-1. Main Assembly

1		149 251	CABLE, trigger (consisting of)	1	
1		149 252	CABLE, trigger (consisting of)		1
	PLG23	079 878	CONNECTOR & PINS	1	1
		079 531	CONNECTOR, circ clamp str rlf sz 11 Amp 206358-2	2	2
		605 156	CABLE, port No. 18 4/c (order by ft)	17ft	21ft
	PLG28	080 328	CONNECTOR w/SOCKETS, free hanging	1	1
2		See Note	CONTROL BOX, (Fig 16-2)	1	1
3		164 475	CABLE, interconnecting (consisting of)	1	
3		164 474	CABLE, interconnecting (consisting of)		1
	PLG37,38	047 636	CONNECTOR & PINS	2	2
		079 739	CONNECTOR, circ clamp str rlf sz 17-20 Amp 206322-2	2	2
		163 519	CABLE, port No. 18/14 8/c (order by ft)	17ft	21ft
4		139 600	HOSE, gas (consisting of)	1	
4		139 599	HOSE, gas (consisting of)		1
		010 603	FITTING, hose brs barbed nipple 1/4tbg	2	2
		010 606	FITTING, hose brs nut .625-18RH	2	2
		603 106	HOSE, nprn brd No. 1 x .250 ID (order by ft)	26ft	30ft
		056 112	FITTING, hose brs ferrule .475 ID x .718 lg	2	2
5		600 324	CABLE, weld cop strd No. 4/0 (order by ft)	26ft	30ft
6		149 884	BRACKET, spring retaining	1	
6		080 947	BRACKET, spring retaining		1
7		602 243	WASHER, flat stl std .375	8	8
8		602 213	WASHER, lock stl split .375	4	4
9		601 872	NUT, stl hex full .375-16	4	4
10		080 157	FITTING, grease 1/8NPT	1	1
11		132 053	SCREW, cap stl hexhd .375-16 x 1.500 lg	4	4
12		Fig 16-3	SUPPORT, hub & reel	1	1
13		♦149 838	PIPE POST, 4ft w/base or	1	
13		♦149 839	PIPE POST, 6ft w/base	1	
13		♦078 264	PIPE POST, 4ft w/base or		1
13		♦079 216	PIPE POST, 6ft w/base		1
14		♦075 078	PIPE POST, 4ft w/o base or	1	1
14		♦079 217	PIPE POST, 6ft w/o base	1	1
15		Fig 16-5	BOOM ASSEMBLY	1	1
16	RC37	047 637	CONNECTOR & SOCKETS	1	1
17	PLG33	135 409	CONNECTOR & PINS	1	1
18	PLG7	115 092	CONNECTOR & SOCKETS	1	1
19		605 227	NUT, nyl hex jam .750NPST	1	1
20	GS1	228 036	VALVE, 24VAC 1way .750−14 thd 2mm orf 100PSI	1	1
21		139 265	COVER, motor & components	1	1
22		156 243	CLAMP, motor top	1	1
23		159 360	INSULATOR, screw machine	4	4
24		145 639	STRIP, buna N compressed sheet .062 x 4.000sq	1	1
25		167 774	DRIVE ASSEMBLY, wire (Fig 16-4)	1	1
25		♦167 776	DRIVE ASSEMBLY, wire (high speed) (Fig 16-4)	1	1
26		157 295	GUIDE, monocoil	1	1
27		604 612	SCREW, set stl sch 8-32 x .125 cup point	2	2
28		082 050	LINER, monocoil inlet wire	1	1
29		159 646	CLAMP, motor base	1	1
30		159 647	INSULATOR, motor clamp	1	1
		180 146	KIT, trigger isolation (consisting of)	1	1
		180 118	CIRCUIT CARD, assembly trigger	1	1
		180 277	PLUG, assembly	1	1
		180 276	PLUG/LEADS	1	1
31		211 989	FITTING, w/screen	1	1

♦OPTIONAL

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

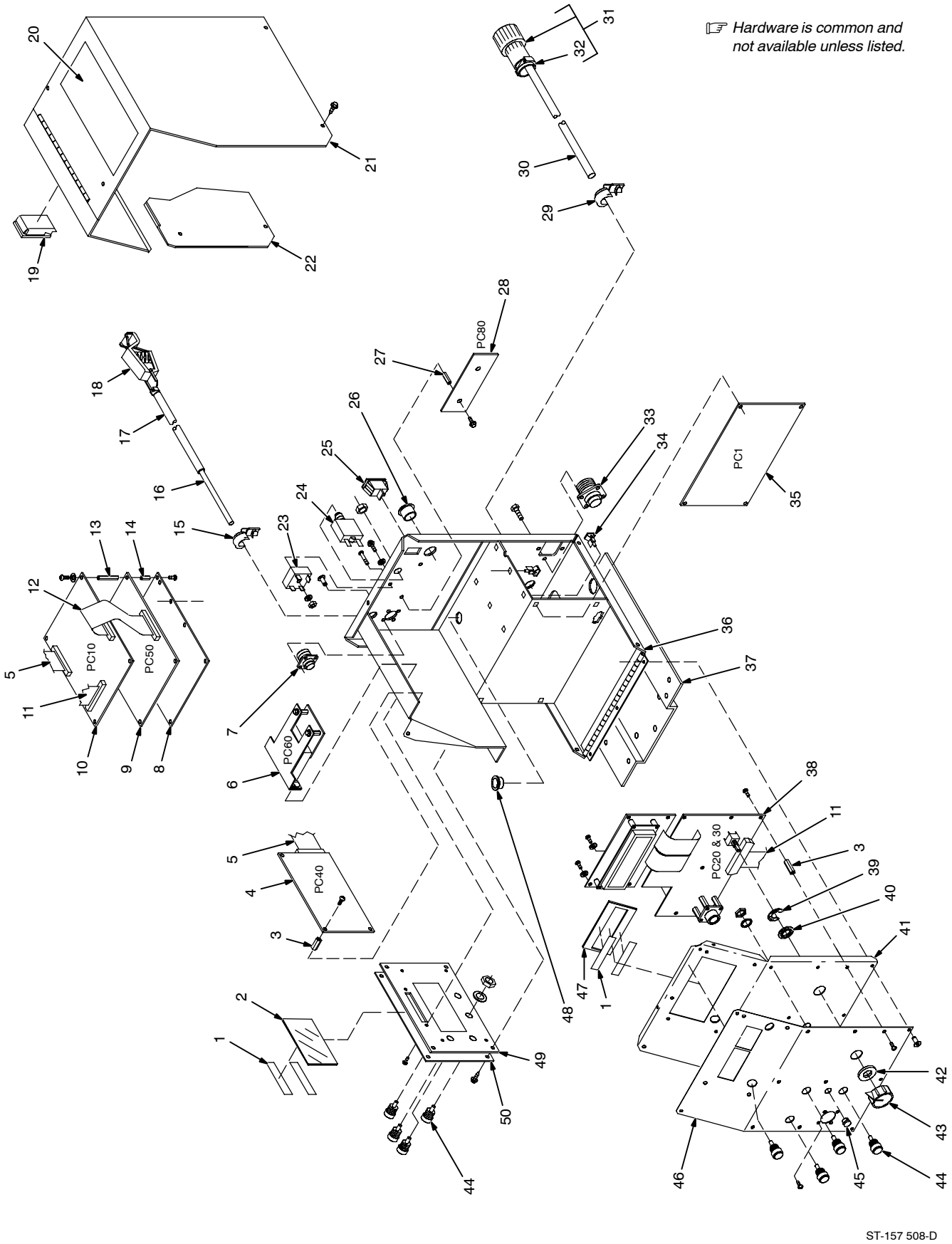


Figure 16-2. Control Box

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 16-2. Control Box (Fig 16-1 Item 2)

.. 1		147 139	.. TAPE, adh acrylic double sided .010 x .500 x 3.000	4
.. 2		155 024	.. LENS, clear anti glare	1
.. 3		144 844	.. STAND-OFF, No. 6-32 x .875 lg	14
.. 4	PC40	158 160	.. CIRCUIT CARD, schd side	1
.. 5	PLG16,41	155 023	.. CABLE, ribbon 24posn 6.000 in (RC16) (RC14)	1
.. 6	PC60	156 623	.. CIRCUIT CARD, cyber card	1
	PLG60	153 501	.. CONNECTOR & SOCKETS (RC60)	1
.. 7	RC70	048 282	.. CONNECTOR w/SOCKETS	1
		079 532	.. CONNECTOR, circ 4 pin Amp 211882-1	
		079 535	.. CONNECTOR, circ pin push-in 18-14ga Amp 66359-6	
		079 531	.. CONNECTOR, circ clamp str rlf Amp 206358-2	
.. 8		154 938	.. STRIP, mtg PC card	1
.. 9	PC50	189 124	.. CIRCUIT CARD, interface	1
	PLG51	158 720	.. CONNECTOR & SOCKETS (RC51)	1
	PLG52	158 719	.. CONNECTOR & SOCKETS (RC52)	1
	PLG53	131 204	.. CONNECTOR & SOCKETS (RC53)	1
	PLG54	148 439	.. CONNECTOR & SOCKETS (RC54)	1
	PLG55	115 092	.. CONNECTOR & SOCKETS (RC55)	1
.. 10	PC10	191 996	.. CIRCUIT CARD, processor w/proms (16 M)	1
	PLG11	115 092	.. CONNECTOR & SOCKETS (RC11)	1
	PLG15	153 501	.. CONNECTOR & SOCKETS (RC15)	1
	PLG17	115 093	.. CONNECTOR & SOCKETS (RC17)	1
	PLG18	162 382	.. CONNECTOR & SOCKETS (RC18)	1
.. 11	PLG10,24	170 980	.. CABLE, ribbon 34posn 12.000 in (RC10) (RC24)	1
.. 12	PLG12,50	155 629	.. CABLE, ribbon 14posn 3.000 in (RC12) (RC50)	1
.. 13		126 689	.. STAND-OFF, 6-32 x 1.500 lg	4
.. 14		097 132	.. STAND-OFF, 6-32 x .375 lg	4
.. 15		138 044	.. BUSHING, strain relief .120/.150 ID x .500mtg hole	1
.. 16		600 399	.. WIRE, strd 14ga blk 600V 105C (order by ft)	35ft
.. 17		176 089	.. TUBING, plstc PVC .250 ID x .370 OD x 9.000	1
.. 18		601 222	.. CLAMP, univ 50A	1
.. 19		151 187	.. LATCH, slide flush	1
.. 20		134 464	.. LABEL, warning general precautionary	1
.. 21		+154 927	.. WRAPPER	1
.. 22		155 261	.. PANEL, side lower	1
.. 23	SR1	035 704	.. RECTIFIER, integ 40A 800V	1
.. 24	CB1	083 432	.. CIRCUIT BREAKER, man reset 1P 10A 250V	1
.. 25	S1	111 997	.. SWITCH, rocker SPST 10A 250VAC	1
.. 26		000 527	.. BLANK, snap-in nyl .875mtg hole	1
.. 27		073 756	.. STAND-OFF, 6-32 x .625 lg	2
.. 28	PC80	182 299	.. CIRCUIT CARD, HF filter	1
	PLG81	115 093	.. CONNECTOR & SOCKETS	1
	PLG82	158 720	.. CONNECTOR & SOCKETS (RC82)	1
	PLG83	115 092	.. CONNECTOR & SOCKETS (RC83)	1
	PLG89	131 054	.. CONNECTOR & SOCKETS (RC89)	1
.. 29		010 290	.. BUSHING, strain relief 1.030 ID	1
.. 30		163 520	.. CABLE, port No. 18/14 11/c (order by ft)	17ft
.. 31	PLG9	141 162	.. CONNECTOR & PINS, (consisting of)	1
.. 32		079 739	.... CONNECTOR, circ clamp str rlf sz 17 & 20	1
.. 33	RC40	047 637	.. CONNECTOR & SOCKETS	1
		048 144	.. CONNECTOR, circ pin plug keying in sockets	2
.. 34		134 201	.. STAND-OFF SUPPORT, PC card .312/.375	8
.. 35	PC1	198 037	.. CIRCUIT CARD, motor control	1
	PLG1	115 092	.. CONNECTOR & SOCKETS (RC1)	1
	PLG2	115 093	.. CONNECTOR & SOCKETS (RC2)	1
	PLG3	115 094	.. CONNECTOR & SOCKETS (RC3)	1
	PLG4	115 091	.. CONNECTOR & SOCKETS (RC4)	1
	PLG6	136 810	.. CONNECTOR & SOCKETS (RC6)	1
.. 36		181 499	.. CASE SECTION, bottom/rear	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 16-2. Control Box (Fig 16-1 Item 2) (Continued)

. . 37		145 948	. . BRACKET, mtg control box	1
. . 38	PC20,30	169 502	. . CIRCUIT CARD, display front	1
. . . . .	PLG25	164 899	. . CONNECTOR & SOCKETS (RC25)	1
. . 39		159 264	. . RING, retaining ext .625 shaft grv x .045thk E style	1
. . 40		167 633	. . WASHER, shldr .612 ID	1
. . 41		167 698	. . PANEL, front	1
. . 42		010 291	. . WASHER, flat .625 ID nylafil	1
. . 43		167 700	. . KNOB, pointer	1
. . 44		153 169	. . ACTUATOR, switch	8
. . 45		179 201	. . LENS, LED 4345 green	1
. . 46			NAMEPLATE, (order by model and serial number)	1
. . 47		164 842	. . METER LENS, w/gasket	1
. . 48		030 170	. . BUSHING, snap-in nyl .750 ID x 1.000mtg hole	1
. . 49		154 933	. . PANEL, inner control	1
. . 50		154 109	. . PLATE, ident inner control	1
. . . . .	PLG39	115 092	. . CONNECTOR & SOCKETS	1
. . . . .	RC7	135 409	. . CONNECTOR & SOCKETS	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Item No.	Part No.	Description	Quantity

Figure 16-3. Support, Hub & Reel (Fig 16-1 Item 12)

1	142 399	SUPPORT, reel	1
2	010 191	WASHER, fbr .656 ID x 1.500 OD x .125thk	2
3	058 628	WASHER, brake stl	2
4	058 428	HUB, spool	1
5	♦108 008	REEL, wire 60 lb (consisting of)	1
6	124 900	SUPPORT, reel spool	1
7	+168 104	RETAINER, spool support (consisting of)	1
8	166 594	LABEL, caution falling wire reel can cause damage	1
9	168 103	NUT, spanner retaining	1
10	057 971	WASHER, flat stl keyed 1.500dia x .125thk	1
11	010 233	SPRING, cprsn .970 OD x .120 wire x 1.250	1
12	605 941	WASHER, flat stl .640 ID x 1.000 OD x 14ga thk	1
13	136 684	NUT, stl slflkg hex reg .625-11 w/nylon insert	1
14	058 427	RING, retaining spool	1

☞ *Hardware is common and not available unless listed.*

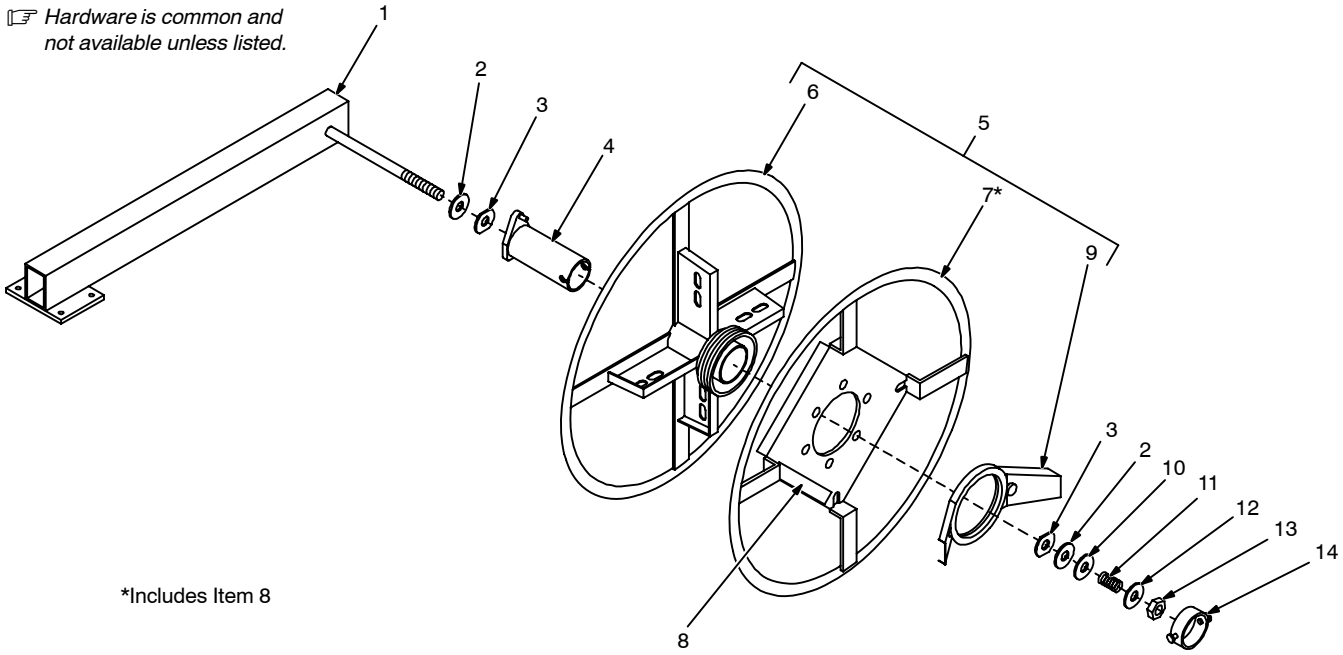


Figure 16-3. Support, Hub & Reel

♦OPTIONAL

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

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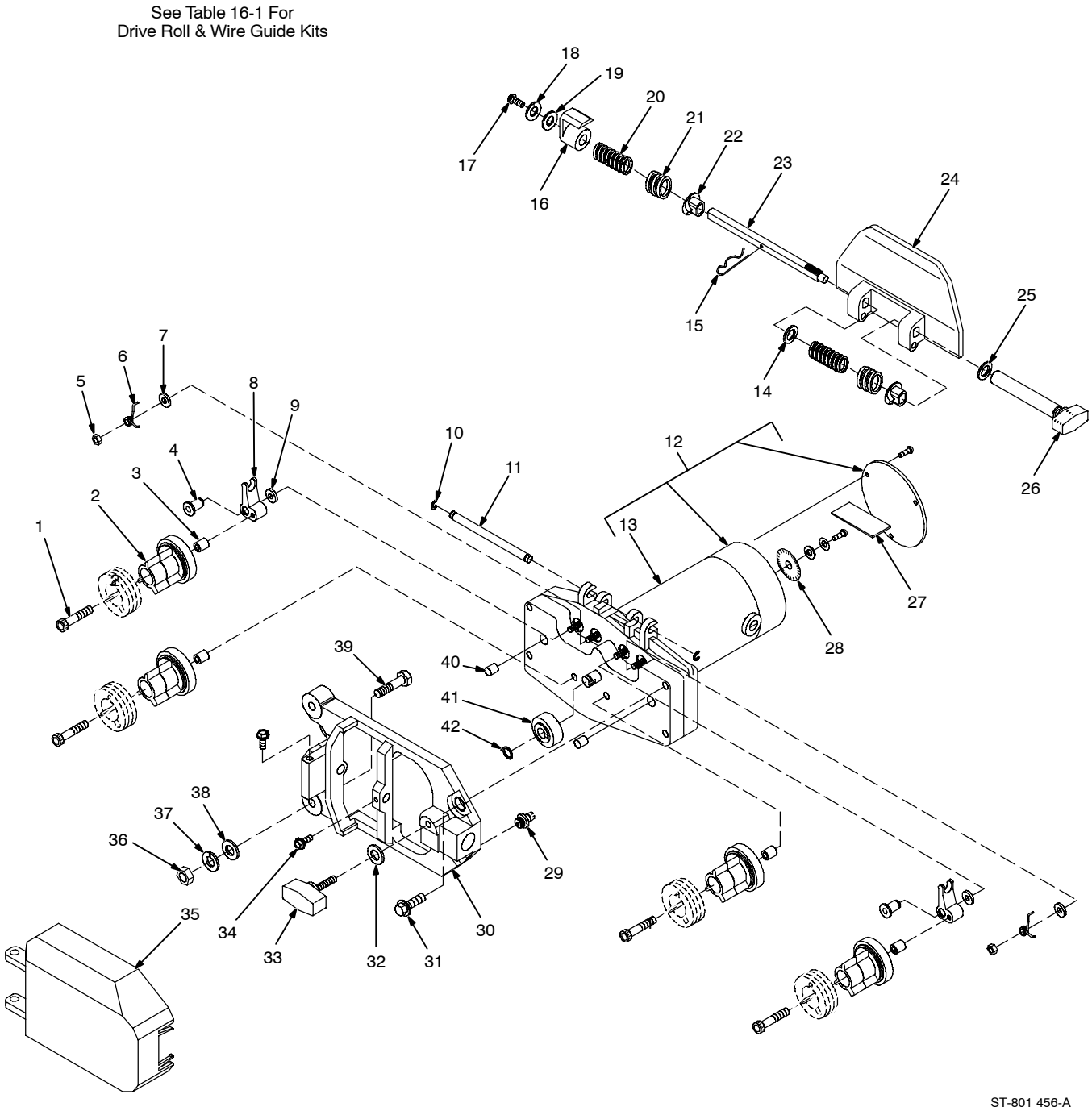


Figure 16-4. Drive Assembly, Wire

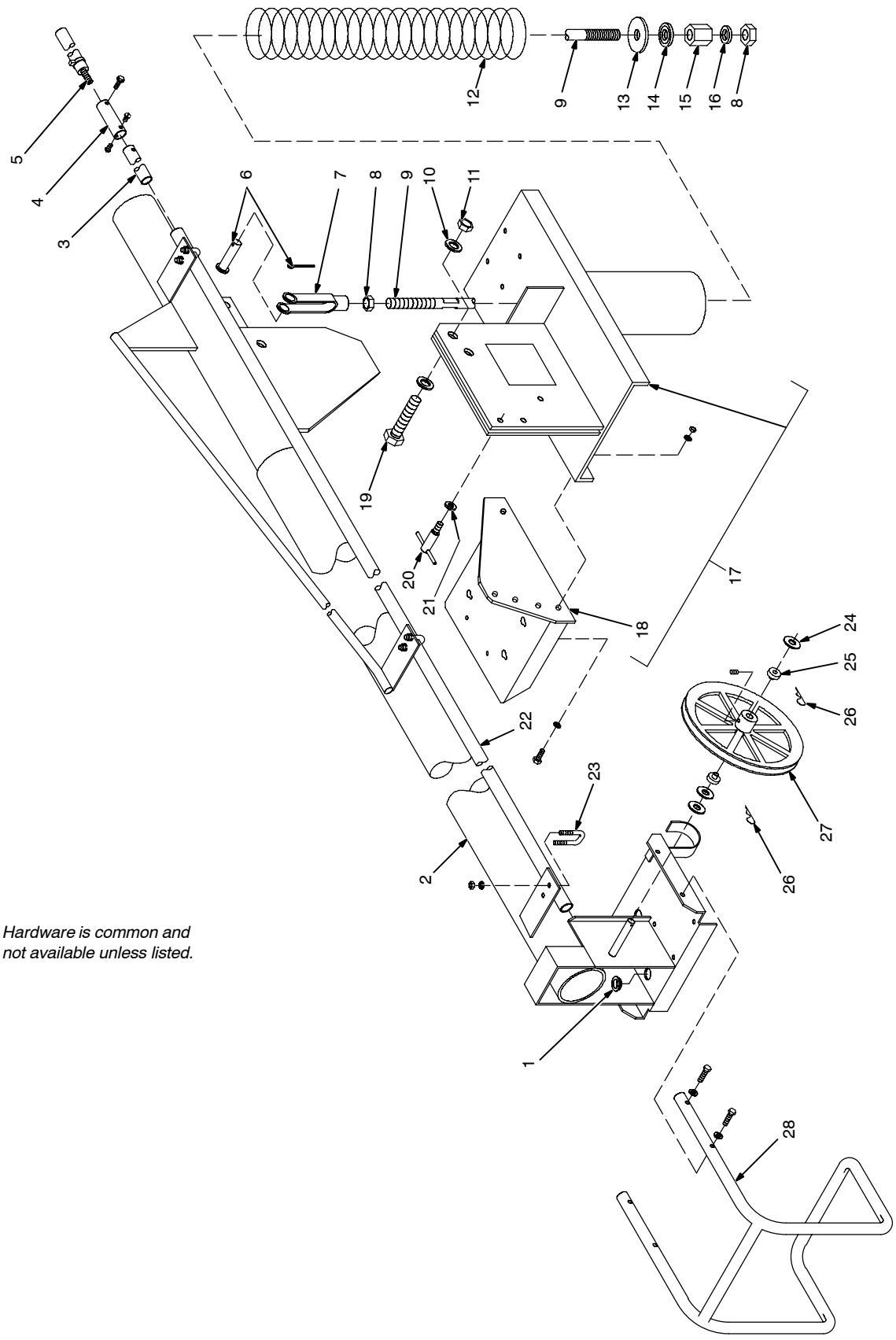
Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 16-4. Drive Assembly, Wire (Fig 16-1 Item 25)	
1		010 668	SCREW, cap stl sch .250-20 x 1.500	4
2		172 075	CARRIER, drive roll w/components 24 pitch	4
3		149 962	SPACER, carrier drive roll	4
4		149 486	PIN, rotation arm rocker	2
5		163 282	NUT, .250-28 stl	2
6		165 798	SPRING, pressure arm retaining	2
7		165 799	WASHER, flat .257 ID stl	2
8		132 750	ARM, pressure	2
9		150 520	SPACER, rotation pin	2
10		133 493	RING, retaining ext .250 shaft x .025thk	2
11		133 350	PIN, hinge	1
12	M1,2	156 354	MOTOR, gear 1/8hp 24VDC 272RPM (consisting of)	1
12	M1,2	♦156 353	MOTOR, gear 1/8hp 24VDC 500RPM (consisting of)	1
		153 491	KIT, brush replacement (consisting of)	1
		153 492	CAP, brush	2
		*153 493	BRUSH, carbon	2
13		155 098	KIT, cover motor gearbox (consisting of)	1
		153 550	COVER, motor gearbox (consisting of)	1
		155 099	GASKET, cover	1
		155 100	SCREW, cover	5
		154 031	SPACER, locating	2
		133 493	RING, rtng ext .250 shaft grv x .025thk	1
		184 136	KIT, brush holder	1
14		182 414	WASHER, flat	1
15		182 415	PIN, cotter hair	1
16		137 248	SPRING, indicator	1
17		129 351	SCREW, hexwhd-slt stl slffmg 8-32 x .500	1
18		602 200	WASHER, lock stl split No. 8	1
19		604 772	WASHER, flat stl SAE No. 8	1
20		182 156	SPRING, cprsn	2
21		182 155	SPRING, cprsn	1
22		132 746	BUSHING, spring	2
23		181 522	SHAFT, spring	1
24		132 747	CARRIER, shaft	1
25		133 739	WASHER, flat .375 ID x .625 OD x .062	1
26		183 330	KNOB, extension	1
27	PC51	198 004	CIRCUIT CARD, digital tach (consisting of)	1
	PLG57	131 204	CONNECTOR & SOCKETS	1
		604 311	GROMMET, rbr .250 ID x .375mtg hole	1
	PLG58	131 203	CONNECTOR & PINS	1
28		132 611	OPTICAL ENCODER DISC	1
29		149 959	FITTING, brs barbed M 3/16tbg x .312-24	1
30		179 265	ADAPTER, gun/feeder LH	1
31		108 940	SCREW, cap stl hexwhd .250-20 x .750	4
32		604 538	WASHER, flat stl SAE .312	1
33		151 437	KNOB, plstc T 1.125 lg x .312-18 x 1.500 bar	1
34		128 237	SCREW, hexwhd-slt stl slffmg 10-32 x .500	2
35		+179 263	COVER, drive roll (consisting of)	1
		196 956	LABEL, warning electric shock and pinch	1
36		601 872	NUT, stl hex full .375-16	1
37		602 213	WASHER, lock stl split .375	1
38		602 243	WASHER, flat stl .375	1
39		601 966	SCREW, cap stl hexhd .375-16 x 1.250	1
40		167 387	SPACER, locating	2
41		168 825	DRIVE, pinion 40T 24P .376 bore	1
42		133 308	RING, retaining ext .375 shaft x .025thk	1

♦Part of 132 129 Optional High Speed Motor

*Recommended Spare Parts.

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.



☞ *Hardware is common and not available unless listed.*

ST-142 601-F

Figure 16-5. Boom Assembly

Item No.	Part No.	Description	Quantity Model 12	Quantity Model 16

Figure 16-5. Boom Assembly (Fig 16-1 Item 15)

1	010 493	BUSHING, snap-in nyl .625 ID x .875mtg hole	1	1
2	159 991	BOOM, single	1	
2	159 989	BOOM, single		1
3	079 665	GUIDE, wire	1	
3	080 811	GUIDE, wire		1
4	079 664	GUIDE, wire inlet	1	1
5	139 633	LINER, monocoil 3/32-1/8 wire x 15.687	1	1
6	073 742	PIN, clevis .750 OD x 2.156 lg	1	1
7	073 741	CLEVIS, .812 yoke 6.062 lg .750-16thd	1	1
8	079 029	NUT, stl hex full fnsh .750-16	2	2
9	075 462	SHAFT, boom counterbalance	1	1
10	602 250	WASHER, flat stl SAE .750	2	2
11	079 020	NUT, stl hex elastic stop .750-16	1	1
12	149 858	SPRING, cprsn 3.750 OD x .625 wire x 36.000	1	
12	080 723	SPRING, cprsn 3.750 OD x .687 wire x 33.750		1
13	150 258	RETAINER, spring	1	1
14	024 605	BEARING, ball thr sgl row .750 x 1.625 x .625	1	1
15	075 101	NUT, stl hex special .750-16 x 1.250	1	1
16	079 030	WASHER, lock stl ext tooth .750	1	1
17	+174 754	BASE, swivel boom (consisting of)	1	1
	080 157	FITTING, grease 1/8NPT	1	1
18	174 688	BRACKET, mtg control tilt	1	1
	142 804	LABEL, Swingarc caution heavy spring	1	1
	134 327	LABEL, warning general precautionary	1	1
19	073 666	BOLT, mach stl hexhd .750-16 x 2.750	1	1
20	047 224	KNOB, T-bar .500-13 thd	1	1
21	602 246	WASHER, flat stl std .500	1	1
22	079 667	PIPE, plstc .500 x 133.750	1	
22	080 812	PIPE, plstc .500 x 181.750		1
23	079 632	BOLT, U stl .250-20 x .875 wide x 1.375 deep	4	5
24	602 243	WASHER, flat stl std .375	3	3
25	079 622	WASHER, shldr .381 ID x .750 OD	2	2
26	010 313	PIN, cotter hair .072 x 1.437	2	2
27	079 621	PULLEY, V sgl grv	1	1
28	139 336	GUARD, motor protector	1	1
	149 322	CLAMP, hose .405 – .485clp	2	2

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Table 16-1. Drive Roll and Wire Guide Kits

Wire Size		Inlet Guide	Intermediate Guide	V-GROOVE		U-GROOVE		VK-GROOVE		UC-GROOVE	
Fraction	Metric			4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll	4 Roll Kit	Drive Roll
.023-.025 in.	0.6 mm	150 993	149 518	151 024	087 130						
.030 in.	0.8 mm	150 993	149 518	151 025	053 695						
.035 in.	0.9 mm	150 993	149 518	151 026	053 700	151 036	072 000	151 052	132 958		
.040 in.	1.0 mm	150 993	149 518	161 189	053 696						
.045 in.	1.1/1.2 mm	150 994	149 519	151 027	053 697	151 037	053 701	151 053	132 957	151 070	083 489
.052 in.	1.3/1.4 mm	150 994	149 519	151 028	053 698	151 038	053 702	151 054	132 956	151 071	083 490
1/16 in. (.062 in.)	1.6 mm	150 995	149 520	151 029	053 699	151 039	053 706	151 055	132 955	151 072	053 708
.068-.072 in.	1.8 mm	150 995	149 520					151 056	132 959		
5/64 in. (.079 in.)	2.0 mm	150 995	149 520			151 040	053 704	151 057	132 960	151 073	053 710
3/32 in. (.094 in.)	2.4 mm	150 996	149 521			151 041	053 703	151 058	132 961	151 074	053 709
7/64 in. (.110 in.)	2.8 mm	150 996	149 521			151 042	053 705	151 059	132 962	151 075	053 711
1/8 in. (.125 in.)	3.2 mm	150 997	149 522			151 043	053 707	151 060	132 963	151 076	053 712

Each Kit Contains An Inlet Guide, Intermediate Guide, And 045 233 Antiwear Guide With 604 612 Setscrew 8-32 x .125, Along With 4 Drive Rolls.
2 Kits Required For Dual Models.

S-0549-D

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Effective January 1, 2006
(Equipment with a serial number preface of "LG" or newer)

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Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts — 3 Years Labor
   * Original main power rectifiers
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Process Controllers
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Sources (Unless Otherwise Stated)
   * Water Coolant Systems (Integrated)
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor Unless Specified
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources, Coolers, and Electronic Controls/Recorders
   * Water Coolant Systems (Non-Integrated)
   * Flowgauge and Flowmeter Regulators (No Labor)
   * HF Units
   * Grids
   * Spot Welders
   * Load Banks
   * Arc Stud Power Sources & Arc Stud Guns
   * Racks
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
   * Bernard-Branded Mig Guns (No Labor)
   * Weldcraft-Branded TIG Torches (No Labor)
   * Subarc Wire Drive Assemblies
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches and Subarc (SAW) Guns
   * Induction Heating Coils and Blankets, Cables, and Non-Electronic Controls
   * APT & SAF Model Plasma Cutting Torches
   * Remote Controls
   * Accessory (Kits)
   * Replacement Parts (No labor)
   * Spoolmate Spoolguns
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear. (Exception: brushes, slip rings, and relays are covered on Bobcat, Trailblazer, and Legend models.)**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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Owner's Record

Please complete and retain with your personal records.

Model Name	Serial/Style Number
Purchase Date	(Date which equipment was delivered to original customer.)
Distributor	
Address	
City	
State	Zip

For Service

Contact a DISTRIBUTOR or SERVICE AGENCY near you.

Always provide Model Name and Serial/Style Number.

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Miller Electric Mfg. Co.
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters–USA
USA Phone: 920-735-4505 Auto-Attended
USA & Canada FAX: 920-735-4134
International FAX: 920-735-4125

European Headquarters – United Kingdom
Phone: 44 (0) 1204-593493
FAX: 44 (0) 1204-598066

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